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SUPPLEMENTARY TO
Surgery, Gynecology and Obstetrics

PUBLISHED IN COLLABORATION WITH
Journal de Chirurgie, Paris
Zentralblatt fuer die Gesamte Chirurgie und Ihre
Grenzgebiete, Berlin
Zentralblatt fuer die Gesamte Gynaekologie und Geburtshilfe
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Volume XXVI
January to June, 1918

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PUBLISHED BY
THE SURGICAL PUBLISHING COMPANY OF CHICAGO
30 NORTH MICHIGAN AVENUE, CHICAGO
1918

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INTERNATIONAL ABSTRACT OF SURGERY

JANUARY, 1918

COLLECTIVE REVIEW

SURGERY OF THE SPLEEN

By D. C. BALFOUR, M.D., F.A.C.S., ROCHESTER, MINNESOTA

THE spleen is unique in that it is a prominent and predominating factor in a very large number of blood dyscrasias and other pathologic processes and clinical entities. Its extensive rôle has produced during the past decade a most voluminous literature. In reviewing this literature, it was found necessary to omit detailed reference to many isolated case reports, which though valuable from a statistical standpoint, were not essential to the purpose of this review.

Historically, splenic surgery is of unusual interest (Krumbhaar, 78, Carstens, and others). The statement has been repeatedly made that in ancient times the spleen was removed from athletes to improve their running, and although this may be doubted, Krumbhaar states that Aristotle suspected that the spleen was not indispensable to life. There seems at least to be no doubt that the spleen was successfully removed from dogs and other animals as early as 1500, and it was common knowledge at that time that animals would live in good condition following removal of the organ. Zaccarelli in 1549 claimed to have removed a spleen from a patient with satisfactory results, but most writers of that period do not credit the story. Well authenticated cases, however, are recorded in the seventeenth century. (Clarke, Matthia). Browne in 1814 reported probably the earliest splenectomy in this country and the patient was living in good health several months later. From that time splenectomy has been performed with increasing frequency, but until the last decade any intelligent classification of the conditions which called for splenectomy had not

been possible. One must admire the courage and the progressive spirit of those who, before methods of determining the blood picture were known, and in spite of the prevailing opinion that the operation was justified only in cases of serious injury with prolapse of the organ, performed splenectomies in patients with splenomegaly and constitutional disturbances (Quittenbaum, Spencer Wells, 127, and others). The surgery of the spleen was tremendously stimulated by the epoch-making communication of Banti (9) in 1894 describing the disease which bears his name. Splenectomy has been at one time or other advocated in a wide variety of diseases and conditions and it will be necessary for the specific purpose of this review to classify these conditions as follows:

1. Anatomical anomalies and injuries
 - (a) Malposition and malformation
 - (b) Traumatism
 - (c) Accessory spleens
2. Tumors, cysts, etc., and new-growths
 - (a) Abscess
 - (b) Angioma
 - (c) Cysts
 - (1) Simple
 - (2) Dermoid
 - (3) Hydatid
 - (d) Sarcoma and carcinoma
3. Chronic splenomegaly occurring in diseases of bacterial or protozoan origin
 - (a) Tuberculosis
 - (b) Syphilis
 - (c) Malaria
4. Diseases in which the spleen has been proved to be the controlling etiologic factor
 - (a) Splenic anæmia
 - Adults
 - Children

- (b) *Hemolytic jaundice*
Congenital and familial
Acquired
5. Conditions with which the spleen is intimately associated primarily or secondarily
 - (a) Hepatic cirrhosis
 - (b) Gastro-intestinal hemorrhage of unknown cause
 - (c) Thrombophlebitis of splenic and portal veins
6. Primary neoplasms of the spleen
 - (a) Gaucher's disease
7. Diseases of the blood and the blood-forming organs
 - (a) Pernicious anemia
 - (b) Splenocutaneous leukæmia
8. Unchanged splenomegaly
 - (a) Idiopathic splenomegaly
 - (b) Chronic suppurative spleen
 - (c) Splenomegaly with eosinophilia
 - (d) Tropical splenomegaly

MALPOSITION, MALFORMATION, AND TRAUMATISM

Malposition and traumatism have been, during modern times, the indications for the only operative procedures other than splenectomy in surgery of the spleen, although Mayo (88) and Truett, have suggested the possible value of ligation of the splenic vessels as a substitute for splenectomy in other than these conditions. Efforts have been made, for example, to relieve the symptoms produced by very mobile spleens by ligating the splenic pedicle (Lanz), although in the majority of such cases splenectomy has been chosen. McDonald and Mackay reported acute torsion of the pedicle of a movable spleen requiring urgent operation for the relief of the symptoms. In many cases of left-sided diaphragmatic hernia, the spleen is to be found in the cavity of the chest and in chronic cases is often firmly adherent (LeConte, Green, Balfour, 5).

It is important to remember that a movable spleen can be and has been mistaken for almost every other type of pelvic, abdominal, and kidney tumor, and vice versa.

In traumatism there has been a choice, depending upon the extent of the injury, between tamponade, suture, splenectomy, or exploration only, if the hemorrhage has ceased. Some important observations have been made during the present war as to the seriousness of injuries to the spleen. Webb and Milligan state that although splenectomy has been looked upon as an operation of high risk in connection with gunshot wounds of the spleen, their own experience in some 20 cases in which the mortality was 75 per cent showed that death occurred in those cases in which other organs than the spleen were also injured and that in their cases of injured spleen alone the rate of recovery was very high. The frequency with which the spleen is injured, in the experience of Wallace, was 54 times in 965 abdominal operations. In 32 instances it was

the only organ injured. The mortality in this group was 50 per cent in uncomplicated cases; 61 per cent in complicated cases. He recommends excision only if the organ is totally disrupted or the vessels torn. If hemorrhage has ceased it is better to leave the organ alone.

Many cases of spontaneous rupture have been reported. Cannaday quotes Senator and Litten as saying that the chief causes are trauma and malaria, but the accident may occur also in typhus, typhoid, infarcts, pregnancy, hæmophilia, and tuberculosis. Willis quotes Johnson and Berger as giving the operative mortality as 25 per cent and the non-operative as 90 per cent. He cites Johnson and Fauntleroy as mentioning pain in the left shoulder as a diagnostic point.

Malformation is of anatomic interest only.

ACCESSORY SPLEENS

Accessory spleens have a very minor importance surgically although Alexander and Romanes report an accessory spleen causing acute abdominal pain due to torsion of the omentum. The fact that accessory spleens are frequently present (11 per cent of all autopsies, Adami and Nicholls) and that they undergo enlargement after splenectomy has been performed, perhaps attaches some importance to them as regards their influence in the permanency of results obtained by splenectomy.

ABSCESS

The occurrence of splenic abscess is not extremely rare. Dege, in 1906, collected about 80 cases. Elting, in a recent review of the subject, shows that the majority of cases occur as a sequence to acute infections, such as typhoid, malaria, dysentery, abscess of the appendix, salpingitis, etc. A few cases apparently have followed trauma, and direct extension from perforation of the stomach, or subphrenic abscess.

Various pyogenic bacteria have been isolated. Kueitner experimentally produced abscesses in spleens of animals by injection of bacteria and oil into the splenic artery, into the substance of the spleen, and by traumatizing splenic pulp without breaking the capsule. Elting states that the greater number probably result from infarcts.

The symptomatology depends on the location of the abscess. The spleen is usually enlarged. An abscess centrally located probably will not be associated with distinctive symptoms. If the abscess is near the capsule, however, pain may be present, either spontaneous or on palpation. The fluoroscope may demonstrate restricted motion, or high position of the diaphragm. There may be an associated pleurisy. Fever is not

constant. Federmann reports a case with sub-normal temperature. Chills occur in many cases, and a leucocytosis of 20,000 to 50,000 is usual. Edema is seen over lower intercostal spaces in some cases. The diagnosis usually can be established by aspiration from which, Elting states, no bad effects have occurred.

The treatment in the majority of cases has been splenotomy and splenectomy. Elting describes three routes by which splenotomy may be carried out: (1) trans-pleural (for abscess of the upper pole associated with subphrenic abscess), by resection of the ninth, tenth, and eleventh ribs in the posterior axillary line; (2) abdominal; and (3) retroperitoneal.

Prognosis without operation is bad (Federmann). However, Doebbelin states that small splenic abscesses are absorbed. In 27 operated cases there were 4 deaths, 15 per cent.

CYSTS OF THE SPLEEN

In 1829 Andral first described a case of cystic disease of the spleen. The incidence of the condition may be judged from the fact that Bircher in 1908 collected in all 54 cases, 21 of which were found at autopsy.

Cysts of the spleen are usually classified as: (1) echinococcus; (2) dermoid; and (3) simple.

Bryan, and Fowler and Sherren, quoting Thomas, place the occurrence of echinococcus cysts of the spleen at about 2 per cent of all cases of echinococcus infection. Splenectomy is indicated and the hooklets and scolices can be demonstrated in the cyst cavity. Finkelstein in 1914 reported 3 cases, in 2 of which splenectomy was performed. Dermoid cysts of the spleen are exceedingly rare.

Simple cysts may be serous, hæmorrhagic, or lymphatic (Bircher) and the result of trauma or occlusion of arterioles from amyloid change and ultimate softening of the parenchyma (Boettcher). They are more frequently found in women (24 in 38 cases). Lymphatic cysts are usually multiple and remain small. Hæmorrhagic cysts are usually single and large. Langhans, Dowd, and others have described angioma of the spleen, Langhans' case being of the pulsating type, and Dowd's of the cavernous type. Boeckelmann described a case of mixed blood and lymph-angiomatous spleen in a child of fifteen months, in which excision was performed. Hæmangioma with later a malignant sarcoma-like growth has been reported by Homans, Theile, and others. In 1906 Powers reviewed 31 cases of non-parasitic cysts of the spleen collected from the literature and reported one of his own.

Small cysts give no symptoms. In cases of large cysts the spleen is large; in some instances there is sudden pain and fluctuation, and pronounced friction rub has been noted. A pre-operative diagnosis has rarely been made. Splenectomy has proved the best operative procedure, although puncture, splenotomy, and cystectomy also have been employed. Bircher gives the operative results in 33 cases as follows: (1) puncture (by cautery), 6 cases, 2 deaths; (2) incision and drainage, marsupialization, 9 cases, 1 death (sepsis); (3) resection of cyst, 4 cases, 1 death (ileus); (4) splenectomy, 15 cases, no deaths.

SARCOMA AND CARCINOMA OF THE SPLEEN

Jepson and Albert in 1904 collected 31 cases of primary sarcoma of the spleen and reported the recovery of a girl of 15 following splenectomy for a nodular sarcomatous enlargement of the spleen. Council in 1912 collected 4 other cases and added one of his own. The types of sarcoma which have been recognized are: (1) fibrosarcoma; (2) lymphosarcoma; (3) small round-cell sarcoma; and (4) endothelial-cell sarcoma. There are no characteristic symptoms of primary sarcoma of the spleen. Pain has been reported by some authors, and a nodular, solid tumor is the most significant sign. There are no blood changes of value. The increase in the size of the spleen may be very slow.

The only treatment is splenectomy. Deaver, Bush, and others have referred to the bad prognosis, but apparently well-authenticated cases of primary sarcoma of the spleen permanently cured by splenectomy have been reported.

Carcinoma of the spleen (primary) is much more rare in occurrence even than primary sarcoma; in fact Bush states that most writers agree that there never has been a convincing case of primary carcinoma of the spleen reported. Smith described a case of metastatic colloid carcinoma of the spleen secondary to malignant papillomatous ovarian cyst removed previously. No other evidence of metastasis could be determined at the time of splenectomy, but the patient died a few months later from general carcinomatosis. The rarity also of secondary carcinoma of the spleen has been the subject of much speculation. Chalotow thinks the protective mechanism of the spleen is not due to anatomic or physiologic factors but to ferments in the spleen. As Hollister pointed out, in advanced malignancy the spleen is usually atrophic and this in conjunction with the fact that all infectious processes are associated with

more or less enlargement of the spleen, argues against the infectious nature of cancer.

TUBERCULOSIS OF THE SPLEEN

The existence of tuberculosis of the spleen without active tuberculous foci elsewhere in the body has been doubted. Bland-Sutton, for example, believing that splenic tuberculosis is always secondary. Mayo (88), Halpenny, and Franke however, have reported cases in which clinical examination could detect no other foci, and in such cases the condition could be spoken of as primary in the spleen. The spleen is frequently involved in children dying of tuberculosis. Hamann, in a collection of 428 cases of tuberculosis in children, found the spleen involved in 66 per cent, while in a large series of cases of tuberculosis in adults, splenic tuberculosis was shown in 19 per cent. Winternitz in 1912 collected 31 cases of splenectomy for primary splenic tuberculosis. Coley in 1848 reported the first case of tuberculosis of the spleen found at autopsy, and Monerret in 1859 reported another. Burke in 1889 was the first to remove the spleen for splenic tuberculosis.

An absolute diagnosis of splenic tuberculosis can rarely be made in the absence of a clear history of an active tuberculous infection elsewhere, although Rendu and Widal in 1899 presented what they believed to be a syndrome characteristic of the disease, in which polycythæmia without leukæmia, and cyanosis was the predominating feature. Douglas and Eisenbrey confirm the observations of Rendu and Widal, citing the case of a man with a red-cell count of 8,800,000 in which the diagnosis was confirmed by operation. This observation has not had general confirmation, however, and in the cases which have come to operation in the Mayo Clinic, polycythæmia has not been present. A diagnosis of splenic tuberculosis can be justifiably assumed in the case of a patient with an otherwise unexplained chronic splenomegaly, who has a quiescent or active pulmonary tuberculosis. Pain over the enlarged spleen may be of some significance in such cases. I recently removed a tuberculous spleen from a patient in whom upper abdominal pain, chiefly in the left hypochondrium, was a most marked symptom, and was explained by the operative findings of most extensive adhesions which completely encapsulated the spleen.

SYPHILITIC SPLENOMEGALY

Splenomegaly is not an uncommon occurrence in early syphilis. In children, particularly, syphilitic splenomegaly is common, Carpenter

showing that syphilis is second only to rickets as a cause of splenomegaly in infancy. Gummatous affection of the spleen is rare both in children and adults (Still).

Splenectomy has been performed in only a few recorded instances of syphilitic splenomegaly but the results have been conclusive evidence that not only may syphilitic splenomegaly occasionally resist the most advanced antisyphilitic treatment, but the disease may be eradicated and the blood picture brought to normal by splenectomy (Coupland, Hartwell, French and Turner, and Giffin, 55). Up to July, 1916, Giffin found only three cases in the literature and added three cases of operation performed in the Mayo Clinic. These cases were characterized by marked splenomegaly, anæmia, positive Wassermanns, failure of improvement after antisyphilitic treatment and treponemata in the walls of splenic vessels. They showed also distinct changes in the liver, and in one, at least, gummata were present. The results in these few cases seem to justify the conclusion that under certain circumstances syphilitic splenomegaly may persist to the point of causing a severe secondary anæmia, and if a thorough trial of antisyphilitic measures is ineffective, splenectomy should be considered.

CHRONIC MALARIAL SPLENOMEGALY

The surgery of the chronic malarial spleen apparently has very limited indications, chiefly because, as Osler pointed out, the spleen gradually becomes smaller although it may take months or even years. There are very few published results of splenectomy for chronic malarial splenomegaly, although Finkelstein advocates splenectomy unless the hæmoglobin is below 30 or 40 per cent and there are less than 2,000,000 red blood corpuscles. Jonnesco and other surgeons have removed the spleen a number of times in such cases with gratifying results.

SPLENIC ANÆMIA

The name splenic anæmia is applied to a group of cases in which splenomegaly and a leucopenic anæmia are the predominating features. Splenic anæmia is considered by many, and probably is, a forerunner of Banti's disease, although there seems to be no doubt that it may never progress to the stage described by Banti. As an argument that the two diseases are quite distinct this loses its force when the extreme chronicity of the disease is realized. Typical examples of early splenic anæmia and of Banti's disease undoubtedly show marked difference, for Banti's disease

is featured by many of the symptoms of an atrophic cirrhosis; in fact, Krull denies Banti's disease as an entity and says it is a form of Laennec's atrophic cirrhosis, and that the liver, not the spleen, is responsible for the condition. Recognizing this difference of opinion, the weight of evidence supports the theory that splenic anæmia and Banti's disease are stages of the same disease, and the subject will be reviewed on that basis.

Osler (99) describes the disease as "an intoxication of unknown nature characterized by great chronicity, primary progressive enlargement of the spleen, which cannot be correlated with any known cause (primary splenomegaly), anæmia of a secondary type, with leucopenia, a marked tendency to hemorrhage particularly from the stomach and in many cases a terminal stage with cirrhosis of the liver and jaundice."

The earliest description of the disease was published in 1866 by Gretscl. In 1871 Wood added materially to the subject. To Banti (9) in 1894, however, must be given the credit for the first classical description of the later stages of the disease.

The frequency of the disease is difficult to determine. Many cases, especially in the early stages, are undiagnosed or masquerading as other diseases. Many reports of individual cases are found in the literature, and especially since the successful surgical treatment has been recognized, the frequency of the disease has been apparent. In the Mayo Clinic 42 patients have been operated on up to May, 1917, and quite frequently cases are seen (particularly in children and in the late stages of the disease), which, although quite possibly belonging to the splenic anæmia group, cannot be positively classified as such.

The etiology of the disease is not established. Many efforts to isolate a micro-organism have been made. Gibson states that the parasitic invasion of the spleen can be shown by special staining methods and that the organism is a streptothrix which cannot be isolated in conditions other than splenic anæmia. D'Espine and others have been unable to confirm this finding. Gibson believes that three facts point to an infective agent: (1) extirpation of the spleen cures or alleviates; (2) the disease is similar to kala-azar; and (3) beneficial effects are obtained from salvarsan. Rolleston (108) draws attention to the fact that the cases forming the basis of Gibson's investigation were not typical splenic anæmias but were complicated by various conditions which could well have been primary;

for example, tuberculosis, syphilis, and cardiac failure. Hollins believes bacillus coli the only cause. He considers that the anæmia is a hæmolytic type and although no broken down cells are found in the spleen he believes that the bacillus coli is responsible for the hæmolysis. He has shown that bacillus coli has a hæmolytic action on blood cells, and lists several of the diseases which may be produced by it. As corroborative evidence he quotes Adami to the effect that bacillus coli is occasionally the cause of hepatic cirrhosis. Warthin, believing that splenic anæmia and Banti's disease are not entities, states that in all the cases he examined he found a thrombophlebitis of the portal and splenic veins, and concludes that this is the primary condition. This theory has not been largely supported by others, although an apparently identical syndrome can be brought about by portal or splenic thrombosis (Edens, Goldmann, Krumbhaar, 77). Ledingham speaks of a traumatic factor. Banti's own views were that the spleen was responsible because he always found splenic enlargement preceding the anæmia, because he noted certain changes in the spleen itself, and because of the therapeutic effects of splenectomy. Hollins in the main believes that the spleen is responsible. He concludes: (1) that it produces the anæmia by increase of its function of hæmolysis (Barr) brought about in turn by vasomotor paresis of the splanchnic area. (Sutherland and Burghard believe this increased hæmolysis is due to loss of vasomotor control of the splenic artery); (2) that the spleen is the center of a chronic infective process; and (3) that the spleen acts mechanically in the production of anæmia (Rolleston, 108). Sérégé points out that inasmuch as the larger part of the splenic blood is delivered to the left lobe of the liver, cirrhosis in splenic anæmia should be confined to this lobe, but it is not. It is significant that in the majority of cases of cirrhosis the spleen is enlarged, and this fact lends strength to the argument that both organs are attacked simultaneously by the same organism. Hollins produced splenomegaly and anæmia in the rabbit by inoculations of bacillus coli. Yates, Bunting and Kristjanson, have described a diphtheroid organism in the spleens of splenic anæmia. Wilson, in repeated examinations of spleens removed from thirty-five patients with typical splenic anæmia, has not observed any organism.

The spleen shows a very marked fibrosis, with atrophy of pulp and malpighian bodies, and the picture is characteristic enough to distinguish it from the spleen in pernicious anæmia, Gaucher's

disease, and splenomedullary leukaemia. The fact that endarteritis and even patches of calcification sometimes occur in the splenic vein branches explains the friability of these vessels often noted in the operation of splenectomy and the serious operative hemorrhages which occasionally occur. Varicose veins are frequently found at the cardia, and compensatory enlargement of the hamolymph glands has been noted, particularly by Dock and Warthin.

The spleen may be very large, its weight varying from 425 gm. to 5,280 gm. (Giffin, 52).

The symptomatology of the disease has been fully described by various observers. The splenomegaly, leucopenic anemia and tendency to gastric hemorrhage and cirrhosis of the liver are characteristic of the disease. In the early stage the diagnosis will not be confused if the symptoms are pronounced. The blood picture differentiates pernicious anemia and splenomedullary leukaemia. Syphilitic splenomegaly is recognized by the Wassermann and history, and hæmolytic jaundice by the acholuric icterus, the crises, an increased red-cell fragility, and evidences of marked hæmolysis. Thrombophlebitis of the portal and splenic veins is associated with the same symptoms and signs as splenic anemia but is supposed to be accompanied by considerable epigastric pain.

As the later stages of the disease become advanced, diagnosis becomes increasingly difficult and, as has been often pointed out, is at times impossible. The patient who, when first seen, exhibits a large spleen, small liver, ascites, gastrointestinal and other hemorrhages and emaciation may be suffering from a primary hepatic cirrhosis or from Banti's disease. The anemia may not be distinctive enough to warrant a diagnosis of the latter. Moreover, even at operation or post mortem a positive diagnosis cannot always be made at such a stage.

Giffin (52), in reviewing the symptomatology of splenic anemia in the precirrhotic stage in a series of eighteen cases in the Mayo Clinic, showed that in this series there were twice as many females as males and that the average age was 37 years. In other series of cases, however, males have been in the majority, Osler (97) reporting 13 in 15 cases. In every case the splenomegaly preceded the anemia. In one case an enlarged spleen had been present twenty years. The blood showed secondary anemia with a leucopenia, in one instance of 1,000 leukocytes. In one case only were the leukocytes above normal, i.e., 11,000. Hæmatemesis is considered a frequent manifestation but had occurred in only

5 of the 18 cases; in Osler's it occurred in 8 out of 15. A history of pain was obtained in 12 cases, in some of which it was of a more or less acute character. Fever is not an infrequent sign in the later stages, but it occurred in only 2 of the early group of 18 cases. Diarrhea was present in 4 cases. The surgical records show that cirrhosis was definite in 5 of the 18 cases. Jaundice was noted twice, in one case without cirrhosis. Recognizable gall-bladder disease was present in 18.5 per cent of the cases.

Krumbhaar (77) discusses Banti's division of the symptomatology into three stages: (1) The preascitic stage, which lasts several years. Gradually increasing weakness and pallor are noticed with digestive disturbances and abdominal pain which may first draw attention to the large spleen. There is an increase of urobilin and a slight leucopenia. (2) The second stage, which lasts but a few months and is characterized by scanty high-colored urine containing an excess of urobilin, and attacks of dyspepsia and diarrhea with slight increase in the size of the liver. (3) The third stage, that of hepatic cirrhosis with recurrent ascites. As Osler has pointed out, it is important to remember in such cases that ascites may occur without cirrhosis. There is occasionally slight jaundice and an atrophic liver with increasing emaciation. Krumbhaar also draws attention to the fact that these stages are frequently not clearly defined.

The treatment indicated is recognized by all writers as being clearly splenectomy. In the early stages the risk is not great and the prospect of permanent cure is excellent. The operative mortality up to 1916 in the Mayo Clinic in 31 cases was 9.6 per cent (Balfour, 6). This includes all cases and every stage of the disease. The mortality, therefore, should be under 10 per cent. This figure can be attained if proper appreciation of the indications for the operation is held.

The late results of operation in the early stage are excellent. Giffin (52) reported that 75 per cent of patients operated on during this stage are in good health. The indication for splenectomy in this stage, therefore, is quite obvious.

In the later stages of the disease, the operative mortality is higher, and when ascites, jaundice, and severe hemorrhages mark the development of an advanced cirrhosis, the operative risk is at least 75 per cent, becoming prohibitive in the terminal stages. Nevertheless, in view of the facts that a fatal outcome is certain in the ordinary course of events, and that removal of the spleen, even in fairly advanced cirrhosis, is

followed by apparent cure, or at least arrest of the process, splenectomy should have serious consideration.

THE SPLENIC ANÆMIA OF CHILDREN

Anæmia with splenomegaly in children has been the subject of much discussion. Hunter divides such anæmias into three groups: (1) those conforming to the adult type; (2) those with a blood picture showing an increase in leucocytes (between ten and twenty thousand) and in which normoblasts and megalocytes are found; and (3) those with a high leucocyte count, many normoblasts. Most writers consider Hunter's third group an exaggerated form of the second group.

The large spleen and the type of the anæmia would suggest the condition, while a leucopenia, particularly when associated with gastric hæmorrhages, would warrant a more or less definite diagnosis. Giffin (54) collected five cases from the literature and reports in detail the case of one patient from the Mayo Clinic, aged 30 months. Haggard has recently reported another case.

Only four cases of splenectomy for the anæmia of von Jaksch have been collected from the literature, the most recent one being by Pool.

HÆMOLYTIC JAUNDICE

Hæmolytic jaundice is a disease characterized by splenomegaly, "non-obstructive" icterus, and anæmia. Congenital, familial, and acquired forms are recognized, but it has been the custom in this country to look upon these types as variations of the same disease. Krumbhaar (77), however, draws attention to the fact that on the continent the congenital and acquired forms are considered as independent conditions, and presents the evidence on which this opinion is based. There are certainly differences, particularly between the familial and acquired types, which may be shown by diagnostic methods and which may be observed clinically. These variations in type are of the greatest interest, and although they have resulted in a temporary confusion, they have produced a wealth of exact information which will be essential in their correlation. It will be safe to assume at the present time and for our present purpose that these many types are variations in degree of the same disease, and they will be so considered here.

Murchison in 1885 drew attention to the occurrence of chronic jaundice in several members of a family, but Hayem is credited with the first description of the disease as a clinical entity. Chauffard made the most important contribution

to the subject from the standpoint of diagnosis, in showing the increased fragility of the red blood-cells in the disease. Thayer in 1911 gave the earliest description in this country of the symptomatology of hæmolytic jaundice.

Literature dealing with hæmolytic jaundice as a surgical entity, especially English literature, is relatively scarce; in fact, Elliott and Kanavel as recently as 1915 presented the first report of splenectomy in this disease that appeared in American literature. They thoroughly reviewed the subject from a surgical standpoint with particular reference to the familial type of several patients they had observed. Giffin (56) in 1917 reviewed twelve cases including congenital, acquired, and familial types of the disease in patients operated on in the Mayo Clinic. Peck in 1916 gave a most interesting account of the first patient with the congenital type of the disease operated on in this country (1912). Elliott and Kanavel point out that there were several instances of successful splenectomy prior to the date of the establishment of the clinical entity of the disease (Spencer Wells, 1888, Bland-Sutton, 1895).

The relative frequency of the various types is indicated by Krumbhaar (77) in a review of 158 cases, of which 51 per cent were familial (43 per cent of these developing after birth) 14 per cent congenital and 35 per cent acquired. These percentages probably represent the frequency of each type better than the statistics of a surgical clinic, for a considerable percentage of patients in the familial group are symptomless throughout life as far as general health is concerned, whereas those with the congenital and acquired types have symptoms usually sufficiently severe to lead them to seek relief. Of the 17 patients observed in the Mayo Clinic "3 were definitely familial, while 6 gave very suggestive histories of familial jaundice" (Giffin, 56).

As yet there has not been a successful effort to place the etiology of the disease on more than a speculative basis, in spite of the fact that the results of splenectomy prove that the spleen is largely concerned in the abnormal hæmolysis which is the outstanding feature of the disease.

Krumbhaar (77) gives the two chief views: (1) that there is a primary lesion in the blood, a dystrophy of the red cells; and (2) that either primarily or indirectly in the spleen there is an exaggerated hæmolytic activity. As Krumbhaar points out, the writers who hold the former belief (Widal and others) lose sight of the fact that splenectomy is a specific in the disease. Those who hold the spleen responsible (Minkowski,

Eppinger, 41, Banti, 10) believe the spleen actively destroys increased numbers of cells and prepares others for destruction. The fact that splenectomy is followed by return of health in these cases and that the clinical evidence of an increased hemolysis disappears, lends the strongest support to the latter view.

The symptomatology of hemolytic jaundice is definite, and the cardinal symptoms are seen in greater or lesser degree in the congenital, familial and acquired forms. The jaundice is chronic and usually of mild degree and is an acholuric jaundice with absence of the itching, petechie, clay stool, and bradycardia which are associated with jaundice due to mechanical obstruction of the common bile-duct. Splenomegaly is constant and may be extreme and the liver is usually enlarged. Anemia is not constant, but is common and may be marked, Krumbhaar (77) collecting 10 cases in which there were less than 1,000,000 red blood corpuscles. The anemia may simulate pernicious anemia (von Stejskal) and Chauffard considers "that there is an icteric form of pernicious anemia which, when accompanied by diminished resistance and reticulated red cells, represents the least compensated form of hemolytic icterus." Epigastric pain is not uncommon and may be severe, simulating gall-stone colic, and in many cases is due to gall-stones. Cholecystitis is probably present in a large percentage of cases, and gall-stones have been found in 58 per cent (Giffin, 56).

Exacerbation of these symptoms, together with malaise, headache, enlarged and tender spleen and occasionally fever, are characteristic of the disease, especially in the acquired form.

In special diagnostic tests, the fragility of the red blood corpuscles is of most importance. It is consistently increased in this disease. The urine does not contain bile-salts except under exceptional circumstances (during a crisis) but bile pigment is always found in the blood, and urobilin in the urine.

An approximation of the degree of hemolysis may be made by the method of Schneider of extracting the duodenal contents by means of a tube and estimating the quantities of urobilin and urobilinogen. Widal, Abrami and Brulé find the auto-agglutination test positive in the acquired form and always negative in the congenital or familial form.

The diagnosis of hemolytic jaundice, therefore, is usually not difficult and is confusing only in the atypical cases. The close relationship of the disease to Hanot's cirrhosis, symptomatically at least, is to be remembered (Mayo, 80).

Surgical treatment of the disease is clearly indicated if the symptoms are at all pronounced or the crises disabling. Difference of opinion exists as to the treatment of hemolytic icterus associated with indefinite and infrequent and mild crises. Undoubtedly many such patients live a normal length of life without inconvenience, and operation may be justifiably postponed until subjective symptoms become more marked. The indication for operation, therefore, is dependent largely on the severity of the disease, the frequency of crises, the symptomatic evidence of developing complications, and the degree of anemia present. When the blood picture indicates marked hemolysis, operation should be seriously considered.

The results of splenectomy in the disease are excellent and the collected cases show a lower operative mortality than in any other condition for which splenectomy has been advocated. Elliott and Kanavel in 1915 tabulated 48 cases in which there were 2 deaths. The patients recovering from the operation obtained a symptomatic cure and sufficient time has elapsed in some of the cases to warrant the belief that the change is permanent. Curiously, although there was an immediate improvement in the blood picture of all the patients, the increased fragility of the red blood corpuscles which was a constant feature previous to operation did not consistently return to normal (Giffin).

Since the adoption of Schneider's method of estimating the urobilin and urobilinogen in the duodenal contents, interesting observations have been possible. Giffin (56) has shown in a study of the patients operated on in the Mayo Clinic that the quantity of bile pigments, which is always increased in the disease, just as constantly tends to approximate the normal following splenectomy. Splenectomy gives its most impressive result in hemolytic jaundice.

CIRRHOSIS OF THE LIVER

In the past few years considerable attention has been directed to the problem of the rôle of the spleen in cirrhosis of the liver. Many observers, particularly Rolleston (107), have attributed certain types of hepatic cirrhosis to poisons originating in the spleen. Reference has already been made to the intimate association between spleen and liver in splenic anemia, and to the fact that splenectomy, even when cirrhosis and ascites had developed, has produced most distinct benefit. This fact, together with much clinical and experimental evidence, gives the spleen a prominent place as an etiologic factor in the group of in-

fectious cirrhoses. The determination of the indication for, and the true value of, splenectomy under such circumstances is not easy because of the inherent difficulties in both clinical and surgical diagnosis. The strong similarity between the hypertrophic cirrhosis of Hanot and hæmolytic jaundice (as pointed out by Mayo, 89), and the difficulty in differentiating certain types of cirrhosis, both in the hypertrophic and atrophic stage, from splenic anæmia, even at operation, are well known examples proving the necessity of very careful investigation of this subject.

Eppinger and Ranzi and others have strongly advocated splenectomy in all cases of hypertrophic cirrhosis of the liver when the spleen is large and there is extreme jaundice, especially in the absence of a history of alcoholism. Rolleston (107) also states that "in cirrhosis due to poisons manufactured in the spleen splenectomy is a logical, if heroic, form of treatment."

In this country there are few records of splenectomy in cases which were considered primary hepatic cirrhosis. Four cases have been reported from the Mayo Clinic, the immediate results of which have been promising.

GASTRO-INTESTINAL HÆMORRHAGE

To what extent a small or slightly enlarged spleen can be held responsible for some of the cases of otherwise unexplained gastric and gastro-intestinal hæmorrhages is not known but there is already sufficient evidence to make it most important to consider diseases of the spleen in these cases of obscure gastric hæmorrhage. Such evidence is furnished by the facts that in certain diseases in which gastro-intestinal hæmorrhages are common, splenectomy is curative; that gastric hæmorrhage may be caused by a distant toxic focus (appendix, gall-bladder, etc.); that the spleen may similarly act as a focus of infection and bring about gastric hæmorrhage either primarily or through the medium of the liver.

In discussing the rôle of the spleen under such circumstances I (8) reported the case of a patient from whom I removed a slightly enlarged spleen on the assumption that it was the cause of repeated gastric hæmorrhages which had subjected the patient to various operations, particularly gastric, but had continued to the point of almost costing his life. Hæmorrhage ceased following the splenectomy and the patient has been in excellent health since. Under such circumstances splenectomy could be justified only after the positive exclusion of every other causative lesion or focus of infection.

THROMBOPHLEBITIS OF SPLENIC AND PORTAL VEINS

Varying degrees of thrombosis of the splenic vein have been described in connection with splenomegaly and especially in splenic anæmia. This finding has suggested that the condition is an etiologic factor in certain cases of splenomegaly and that thrombophlebitis of the splenic and portal veins occurs as a primary condition, that it is a clinical entity and is associated with a rather definite clinical picture in which enlargement of both spleen and liver, ascites, epigastric pain, and possibly a history of traumatism are features. Rolleston (107) suggested splenectomy in such a condition and Tansini and Morone report a case of splenectomy in the third stage of Banti's disease in which the splenic vein and its branches were changed into hard cords. They admit, however, the uncertainty as to the primary condition although Banti thought it was not a primary splenomegaly.

GAUCHER'S DISEASE

Originally considered by Gaucher (1882) as a true neoplasm, this disease is now looked on as clinically non-malignant. Brill and Mandlebaum showed that the changes found in the spleen were not confined to that organ, but that similar endothelial proliferation could be demonstrated both in lymph-nodes and bone-marrow. They also described certain clinical features of the disease. The onset occurs usually in childhood, with a chronic course (average 20 years) although Niemann reports an apparently acute form of the disease. In many respects, particularly in the character of the anæmia (of a moderate degree and with a leucopenia) and in the tendency to mucosal hæmorrhages, Banti's disease is simulated.

The splenic enlargement is supposed to be greater in this than in other diseases associated with splenomegaly. Krumbhaar (77) states that the disease has been recognized before operation on four occasions, once by splenic puncture. It can not be expected, inasmuch as there is disagreement among pathologists as to the authenticity of some of the cases reported as Gaucher's disease, that the late operative results will be as yet accepted. Krumbhaar, for example, states that a "cure can hardly be expected, as the disease is known to exist independently in bone-marrow and lymph-nodes." Nevertheless, patients with apparently substantiated Gaucher's disease are living several years after operation in good health, with every indication of a permanent cure.

PERNICIOUS ANÆMIA

The actual and relative value of splenectomy in pernicious anæmia is as yet to be proved. The group of patients who have been splenectomized in this country for pernicious anæmia during the last three years is sufficiently large to permit conclusions as to the results of the operation, but any conclusions as to final results will be acceptable only when a considerable period of time has elapsed since the operation. It is most important, however, to remember that an investigation of the condition of these patients at the present time is quite useless as a criterion of the effect of splenectomy on the disease itself.

From the available operative results certain facts may be recorded. For instance, Krumbhaar (79) has shown that during the earlier experience with the operation the deaths occurring immediately or within six weeks after splenectomy reached as high as 20 per cent. It soon became apparent that many of these deaths were due not to the inherent risks of the operation, but to the condition of the patient. As soon, therefore, as the unwarranted surgical risks were avoided the operative mortality dropped well below 5 per cent. The more intelligent selection of cases for splenectomy was the result of the recognition of the fact that the operation itself was of high risk in certain stages of the disease and that even if the patient recovered, a remission of symptoms could not be reasonably expected.

That splenectomy will effect a more prompt and more prolonged remission of symptoms than has been possible under previous methods, is the opinion of the majority of those who have been in a position to observe large series of cases (Cabot, Moffitt, Krumbhaar, 79, Giffin, 57, Percy, and others). But there is as yet no proof that splenectomy will cure the disease, or even bring about a permanent arrest of symptoms. Despite encouraging earlier reports it is found as time goes on that in many of the promising cases there are recurrences or that in some instances the patients have died, so that the value of splenectomy becomes increasingly dubious. Percy, however, is quite sanguine over the results he has obtained by removing other possible foci of infection, particularly the gall-bladder and appendix, at the same time that he performed the splenectomy.

The present status of splenectomy in pernicious anæmia as indicated in the reports from various sources; therefore, is as follows: (1) The operation has no place in advanced stages of the disease. (2) under certain conditions the operation

may be justifiably advised (i.e., when a patient not beyond middle life gives only a short history of the condition, the anæmia is moderate in degree, the spleen is enlarged, the skin icteroid and there is a definitely high hæmolytic. Nothing more than a temporary remission can be promised. (3) Transfusions of blood both before and after splenectomy are a most useful adjunct to the operation.

SPLENOMEDULLARY LEUKÆMIA

The results of the surgical treatment of splenomedullary leukemia in the past have been very discouraging. The earlier operative experience was associated with such a high initial mortality that the operation was practically abandoned.

Warren, who in 1911 reported one case of splenectomy for this condition followed by recovery and referred to the 42 cases collected by Hagen with 4 recoveries, attributed the serious operative risk to secondary hæmorrhage from the wound. It must be remembered that at the time these unfavorable results were reported, splenectomy was performed during the active period of the disease and when the number of white cells was large, showing a high ratio to the red cells. There have been since that time isolated reports of splenectomy for splenomedullary leukemia in some of which the diagnosis was rather seriously doubted (Richardson).

The surgical profession has hesitated, therefore, to adopt operative measures in this disease, but since it has been demonstrated that radium, X-rays and benzol exert a specific, although temporary, effect on the symptoms of myelogenous leukemia (Billings and others), splenectomy has again come up for consideration. Radium appears to exert the most powerful influence on the spleen and on the blood picture and there have been several cases reported of remissions that have been produced by radium in conditions entirely resistant to X-rays and benzol (Ordway, Giffin, 58).

The therapeutic value of these agents being sufficient to bring the blood picture to normal, to greatly improve the patient's general condition, and to gradually reduce the size of the spleen (in some instances until it is non-palpable) suggested the possibility that removal of the spleen at this stage might have some influence on the course of the disease, particularly if these therapeutic agents were used as adjuncts. It has already been demonstrated that under such circumstances splenectomy may be done with a very low operative mortality. In the

Mayo Clinic since October 2, 1916, 17 patients have been operated upon with splenomedullary leukæmia in which the blood picture had been first brought to normal by the use of radium, X-rays, or benzol, or a combination of these agents. There have been no operative deaths in this series but we have as yet no knowledge as to the ultimate results of the operation.

UNCLASSIFIED SPLENOMEGALY

There are finally a number of cases of splenomegaly which cannot as yet be classified. This group will include: (1) simple or idiopathic splenomegaly, which may persist for years without any anemia; (2) splenomegaly with eosinophilia, one instance of which is reported by Giffin (53); (3) chronic polycythæmia with splenomegaly, a group described by Osler (98); (4) chronic septic splenomegaly, in which moderate enlargement of the spleen occurs with anemia, a condition thought to be due to preceding abdominal or systemic sepsis; (5) Egyptian splenomegaly, in which there is an acute course, with high fever and rapid development of large spleen and liver without evidence of sepsis and without jaundice; (one similar case has been reported by Giffin, 53); and (6) the tropical splenomegalies, kala-azar, etc., which, to my knowledge, have not been classified and in which, as yet surgical treatment has not had an extensive trial.

In conclusion it should be emphasized that in diseases of the spleen it is absolutely essential that the surgeon should realize that physical findings are of minor importance, and that a correct diagnosis must depend on the clinician who in turn must in large part rely on the various laboratory findings and special diagnostic methods. In such instances, therefore, the surgeon takes his cue from the clinician and then adds his opinion as to the advisability of splenectomy, an opinion which will be based on the condition of the patient and the probable benefits that will be gained from the operation.

TECHNIQUE OF SPLENECTOMY

The surgery of the spleen is practically confined to splenectomy, although ligation of the blood supply may have limited usefulness. The incision usually preferred is in the left rectus. The length of the incision varies with the size of the spleen, is continued upward to within an inch of the costal margin, and in the presence of a very large spleen, parallels the costal margin to the midline if necessary. Some surgeons (Warren) use a "T" incision when a large spleen is to be removed. Others speak of the occasional

advisability of rib resection (Meyer). Kanavel (39) recommends elevation, tilting of the body by means of sand-bags, in order to facilitate the operation. The necessity for the best possible exposure is indicated by these various suggestions.

The importance of a careful abdominal exploration is emphasized by Kanavel and others, in view of the frequent gall-bladder and liver complications in the diseases for which splenectomy is advocated. The essential features in the operation as performed at present in the Mayo Clinic and which I (7) have previously described are as follows:

1. The accessory adhesions and gastrosplenic omentum are separated, divided, and ligated. Division of the gastrosplenic omentum frees the fundus of the stomach which comes into view in every instance and must be carefully protected from injury.

2. The dislocation of the spleen may be accomplished in the majority of instances by stripping the adhesions with the fingers. In a few cases it is necessary to divide adhesions between clamps. After the spleen has been displaced from its diaphragmatic and renal position a large pack may be introduced into the space formerly occupied by the spleen. This pack serves to support the spleen, and if it is well placed and left undisturbed until all other steps in the operation are completed, will often obviate the ligation of veins of some size which might entail much technical difficulty.

3. The spleen is now carefully elevated, and tracted toward the midline and unless accessory vessels are encountered along the posterior border of the pancreas, the pedicle may be ligated. The pancreas occasionally comes into the operative field, usually over the posterior aspect of the pedicle, and in some instances the tail of the organ must be displaced before the pedicle can be ligated. A very exact and safe method is to first carefully expose and individualize the arterial and venous branches in the pedicle from the posterior aspect by dividing the fibrous investment of the pedicle. The successive division of each arterial and venous trunk beginning with the lateral vein on each side of the fan-shaped pedicle will permit a very useful mobilization of the spleen, so that the clamping of the central portion of the pedicle which usually contains the splenic artery or its largest branch, is very much favored. It is rare that such a method is not feasible, and in such event ligation *en masse*, preferably by the two-clamp method, can be carried out. Gerster in 1915 suggested the preliminary ligation of the

arterial supply in order to conserve as much as possible of the blood in the spleen by forcing it out through unclamped veins by manual compression of the spleen. Lockwood recently suggested the use of the method of Lichtenstein, i.e., the reintroduction of the blood which can be expressed from the removed spleen into the patient's veins.

Under favorable circumstances splenectomy is not a difficult or dangerous operation. Many surgeons, however, have referred to the unexpected and serious difficulties which may be encountered through hemorrhage, either from the pedicle itself, or from accessory veins. A methodical operation will minimize such possibilities, but not entirely obviate them. Troublesome bleeding is usually venous, and can therefore be temporarily controlled by the pressure of a gauze pack until the spleen is removed. Usually such torn veins can be ligated but it may be necessary to leave the gauze pack in place until a few days later. When the bleeding can be controlled with forceps but the vessels cannot be safely ligated because of their friability, the forceps may be left in position. At the end of seventy-two hours they may be loosened and, if no oozing has taken place, removed in eight or ten hours.

It is therefore of great importance to anticipate such operative complications. This can be accomplished in large measure by the routine of first dividing and ligating the gastrosplenic omentum and all accessory adhesions possible before attempting the mobilization of the spleen.

The danger of injuring the stomach or pancreas has already been referred to and was early emphasized by Mayo (88).

The difficulties in the operation of splenectomy are to some extent dependent on the disease or condition for which the operation is performed. In pernicious anemia, for example, splenectomy is practically never attended by technical difficulty. In hemolytic jaundice the operation is usually without special risk although the spleen is occasionally very large. Splenic anemia is most frequently associated with high operative risk, particularly in advanced stages of the disease, oftentimes due, as has already been mentioned, to the thrombotic changes in the splenic and accessory veins. The same is true in hepatic cirrhosis. In diseases which occur with less frequency splenectomy has no special risks.

The postoperative course of splenectomized patients depends also to a large extent on their condition at operation. For example, in the cirrhotic and ascitic stage of splenic anemia, convalescence is protracted and uncertain. If a

patient is a good surgical risk and the operation not of extraordinary difficulty the postoperative course compares favorably with that of any other major abdominal operation.

Of the actual complications it would be expected that left-sided pleurisy, with or without fluid, would occur with greater frequency than in other abdominal operations, and this is true.

The occurrence of a rise in temperature on the second or third day in some cases has been the subject of some speculation. Bland-Sutton has attributed it to infection in the stump of the pedicle, others to pancreatic disturbance.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Aymard, J. L.: *Some Principles of Plastic Surgery; Incisions, Contour and the Suture.* *Lancet, Lond.*, 1917, cxviii, 347.

The prime factors of artistic work in plastic surgery are the restoration of contour and the correct method of suturing.

The three essentials to bring about a contour as nearly normal as possible are: a correct method of incising the skin, the manipulation of the deeper structures, and the best method of bringing about satisfactory union.

There are two skin incisions, i.e., the one in which the skin is divided at right angles to the surface, and the other upon the slant. In the slant incision the upper flap assumes a curved form and the under one a convex. The skin edge of the upper flap presents an irregular, fringe-like appearance, due to the series of ridges and holes in the skin. The slanting incision is very suitable for work on the cheek, mouth, chin and forehead; but where the skin is loose, as about the eye and neck, the right-angle incision is more suitable.

To fill up the gap in the deeper tissue produced by the excision of a depressed scar, where the depression is slight, simple undercutting may suffice. A preferable method is undercutting straight down to the bone and back from the incision, thus loosening a block of deep tissue dependent upon the skin flap for its blood supply. These blocks from either side may then be rolled together and secured with catgut to fill up the gap.

To approximate the skin edges the author uses a mattress horseshair suture, which gives a small linear scar.

V. C. HUNT.

Summers, J. E.: *Simple Method of Resecting the Transverse Colon.* *Ann. Surg., Phila.*, 1917, lvi, 317.

Summers recommends the following operation for resection of the colon in non-malignant disease.

The operator lifts the omentum with one hand sufficiently to recognize the line of junction of its under surface with the upper surface of the colon. With a sharp pointed knife the peritoneum is nicked along this ligamentous line to the desired extent of resection. With a gauze sponge the omentum is freed upward from the transverse mesocolon to the lower border of the stomach, exposing but not injuring the mesentery blood

vessels. The resection of the colon is then done in the usual manner, being facilitated by an accurate view from above of each blood vessel in the mesentery. After the completion of the anastomosis, end-to-end, or lateral, the omentum is made to cover the line or lines of suture of the anastomosis in such a manner as indicated in the particular case.

The author has employed the following technique for the correction of prolapse of the transverse colon based upon the Lardennols-Okinczye-Paschet studies in clinical anatomy. It consists in opening the lesser cavity of the peritoneum as described, suturing the transverse colon to the posterior wall of the stomach along the line of its greater curvature, thus practically placing the transverse colon in the lesser peritoneal cavity, then dropping the omentum forward. In several instances in which the hepatic flexure was not properly fixed by this technique, he brought up a piece of omentum to the right of its detachment from the colon, and after ascertaining by upward and outward traction the proper position of the flexure, sutured this omentum to the parietal peritoneum. When the position of the stomach has appeared to require it, he has in addition done a gastropexy.

G. W. HOCHREIN.

Stokes, J. H.: *Certain Technical Refinements in Methods of Intravenous Injection.* *Med. Rec.*, 1917, xlii, 529.

No salvarsan is given to ambulatory cases, each being in the hospital at least twenty-four hours. From 60 to 80 per cent of the injections have been salvarsan or arsenobenzol and the remainder neosalvarsan. Strict asepsis is carried out. The reagents used in the preparation of the drug conform to the original Ehrlich criteria or standard modifications. Water re-distilled in Pyrex or Jena glass and boiled is used in all injections. The glassware is boiled in distilled water. Neosalvarsan is given by a slightly modified Ravaut method. Salvarsan is given by the gravity flow. The needles and ampules of salvarsan are sterilized in 95 per cent phenol, followed by alcohol, and the needles rinsed in re-distilled water. Concentrated solutions of salvarsan are not used. A light breakfast is given, and the temperature, pulse and respiration are taken before the patient enters the operating room.

The arm, preferably the left, is prepared with tincture of iodine which is partly washed off with

alcohol. The arm, shoulder and neck should be bare to avoid any constriction which might hold the drug in the vein and favor thrombosis. The light should strike the arm from the side. The patient lies on the table, arm extended at full length at right angles to the body and resting with the palm of the hand on the slanting bedside table. The tourniquet is not tied, but held by the assistant who pulls downward on the ends.

Methods of locating and entering the vein and also the syringe technique are given in detail. Close attention should be given to the type and care of needles. Illustrations are given showing the best type of point and the way to sharpen the needle. The gold needle is much in use. For routine syringe injections a $1\frac{1}{2}$ inch gold Luer needle of 20 gauge is satisfactory. For minute and delicate veins a steel hypodermic needle $\frac{1}{2}$ inch long and 22 or 24 gauge is best. It should not be re-sharpened. One minim of a 2 per cent solution of cocaine for local anesthesia is used sometimes. The Schreiber needle and technique of its use is given. In small children the external jugular, anterior auricular, or the prominent scalp vein in heredosyphilis may be used.

A summary of rules is appended to be applied if with either technique a free flow of blood through a needle after introduction or a free flow of fluid into a vein cannot be obtained.

1. Depress the point of the needle without advancing. The bevel may be shut off against the top of the vein.

2. Palpate the point with the free hand. It is easily recognized if it is above the vein.

3. In using a syringe, twist the piston in the barrel, pulling backward. It may be stuck.

4. Slowly withdraw the point, if it cannot be felt above the vein, lifting up at the same time. If it has entered the opposite wall it usually comes away with a palpable snap. Then quickly advance again, pressing down hard against the arm with the back of the syringe hand and lifting the point to flatten the angle of the needle to the vein.

5. If the above procedure fails twice, withdraw the needle until the point is just short of the skin puncture, and advance again after repalping the vein. This is the last resort.

6. If the fifth procedure fails on one or two trials, withdraw the needle entirely and do not reintroduce it until satisfied that the point is good, and that it is not plugged. Pressure on the vein for five minutes with elevation of the arm while this is being done will often make possible the use of the same vein again.

7. Make no comments audible to the patient regarding the condition of the needle.

8. Never try to inject through a hæmatoma. Use another vein or desist.

9. Never inject and ask if it hurts, if there is the slightest reason for suspecting that it will. The injection of a little to find whether the needle is in the vein or not is absolutely inexcusable.

10. Make every effort to have one puncture suffice, using the needle in various directions through the same puncture.

CARL R. STEINKE.

ASEPTIC AND ANTISEPTIC SURGERY

Lawrence, J. S.: *Carrel Treatment of Wounds Applied to Civil Practice*. *Bull Johns Hopkins Hosp.*, 1917, xxviii, 204.

Lawrence states that the Carrel-Dakin method of treating infected wounds depends for its success so largely upon the technique with which it is applied that it seemed advisable to him to write out carefully the various steps, paying particular attention to the bacteriological phase. It is very necessary, he states, that careful attention be given to the bacterial content, which should be regularly ascertained as a guide for the surgeon. Second infection may readily occur after the wound has been under treatment even in the hands of the most skillful attendants, and for its detection the bacteriological charts are found more serviceable than the temperature records. The method described has been simplified so that it may be used for the treatment of one or many cases, in hospitals, in the dispensary or office. It is the technique employed in the Johns Hopkins Hospital.

In order to secure satisfactory results from the employment of the Carrel method, Lawrence states that it is absolutely necessary that the following points be given the strictest attention. First, Dakin's solution must be very carefully prepared according to the formula described by Daufresne. It breaks down readily when exposed to light or air and hence should be kept well corked in colored glass bottles, never in metal containers. A preparation more than a week old should not be used. This solution is not a powerful disinfectant but a mild antiseptic. Second, this is not a system of drainage, but of irrigation. Third, a knowledge of the efficiency of the treatment can be obtained only by systematic, accurate and careful bacteriological observations.

The steps in the method are as follows: If the wound is the result of an accident and is filled with dirt, shreds of clothing and other foreign bodies, all of the debris should be removed with forceps and by scrubbing with green soap and sterile water. A brush can be used for this purpose if necessary. Shreds of tissue that are without a blood supply should be excised. If the injury is a puncture or penetrating wound that is more extensive beneath the skin than on the surface, it should be opened so that thorough irrigation may be established. The object is to prevent the multiplication in any part of the wound of the numerous bacteria that were introduced by the accident. In the presence of Dakin's solution, when properly made, no bacteria can flourish; their development is inhibited, while the body tissues are not hindered in their repair work. Phagocytosis as a rule is observed to take charge of the introduced organisms.

Healing of the wound by first intention can be expected in many cases, but if the wound is more than six hours old, or if there is a chronic sinus discharging pus, the problem is more difficult; the wound should be thoroughly cleansed, foreign bodies removed, necrotic tissue cut away and the surface opening increased, if necessary, in order to secure the best results from the irrigation. A counter opening should be avoided in deep wounds, when possible, and in penetrating wounds the perforation farther from the main injury should be encouraged to close early.

The object is always to secure thorough flooding of the injured tissues at each irrigation. To help insure this, a certain type of rubber tubing with a caliber of about 4 mm. is used for insertion. It is tied off at one end, and perforated at this end with from eight to twelve holes made with a No. 4 leather punch, the first hole being placed as near to the tie as possible and the others arranged spirally and about half an inch apart.

The irrigation should be sufficient to more than flood the entire wound so that the wound is washed at each irrigation, but care should be taken not to use so much that the outer dressings or the bed become wet. The irrigations should be made every two hours. A longer interval permits the dressing to dry in some instances, thus giving an opportunity for bacterial development, whereas a shorter interval results in too great a flooding of the wound and in some patients an irritation of the skin from wet dressings.

The continuous drip the author found to be undesirable. Under no condition should the dressings be removed by any but the attending surgeon, and then only under the strictest antiseptic conditions; usually one dressing a day is sufficient and when the wound is almost healed, the dressing may be done at two-day intervals if the surgeon is pressed for time. From the beginning the wound should be treated as a sterile wound. Only the most accurate aseptic technique will succeed. Reinfection is always possible either with the same or with different organisms. This danger cannot be emphasized too forcibly, for while the reinfection may not be accompanied with clinical symptoms, yet the implantation of new organisms reproduces the complex conditions of combined infections and postpones the date of recovery.

The more nearly every wound was treated as though exposed to infection, the more satisfactory were results found to be. The irrigation may be done by a nurse without disturbing the patient, even while the patient sleeps at night; and this two-hourly interval must be observed throughout the 24 hours. To protect the wound from infection by organisms on the skin and also to protect the skin from irritation by Dakin's solution, the author suggests the use of strips of gauze about four inches wide previously steeped in sterile vaseline and picric acid, with which he covers every part of the skin about the wound, but not any of the wound or the gran-

ulating surface. The hair in the neighborhood of the wound is kept closely shaven.

On every other day Lawrence considers an inspection necessary of the bacterial content, both as to number and variety. No irrigation is permitted for at least two hours preceding this dressing. With a sterile platinum spatula a bit of material is taken from the most vicious part of the wound or, if the wound looks uniformly good, specimens are taken from several points. The spatula must be sterilized each time just before it is applied to the wound. The material is spread in a thin film over a glass slide and allowed to dry. The film should not be too thick, otherwise it may be too dense for examination. In the laboratory this film is stained with methylene blue and examined with an oil immersion lens. A certain amount of experience will accustom the examiner to choose fields of a certain density as standard.

These fields should have the pus cells arranged in a single layer and uniformly covering the whole field. The number and variety of organisms are noted. The noting of large and small bacilli, staphylococci, and streptococci, the author considers a sufficient distinction as to variety. In counting, he pays no attention to variety but counts the organisms as a whole. If there are a hundred or more germs in the field, he examines a second and third field; and if these too show great numbers, the count is said to be "infinity," and no further examination is necessary. If, however, there are only five or ten organisms in the field, then five other fields in different parts of the slide are examined, the total count of all the fields is averaged and this average taken as the count. If the bacterial content is even poorer, perhaps only one or two to a field, at least ten fields are examined; when the count is lower than this, 20 or more fields are searched.

The great advantages of the Carrel method of treating infected wounds are summed up as follows: It successfully checks the extension of the infection, causes an almost immediate drop of temperature and brings comfort to the patient. Pus is eliminated and dressing simplified. An early opportunity is given for surgical repair work. The production of cicatricial tissue is minimized and the interference with the function of the part is less after the recovery of the patient. Finally, it is a scientific and intelligent method of observing the process of healing in wounds and determining the efficacy of treatment.

GEORGE E. BELLAN.

Kellock, T. H.: A Method of Applying Antiseptics to the Deeper Parts of Wounds. *Lancet*, Lond., 1917, CIVIL, 348.

The multitude of septic wounds at the present time has given rise to the use of a variety of antiseptics and many methods of application.

The perforated tubes used in the Carrel method have certain disadvantages. If there is much resistance to the exit of the fluid in the deepest

part of the wound, the solution finds its way out through the openings nearer the surface of the wound and the deeper parts are not bathed. These tubes also act as drains, and pus finding its way into them through the openings is washed back into the wound with the fluid. Movement of the patient is also apt to cause the tubes to be drawn out of the wound.

To obviate these disadvantages, the author uses a tube 8 to 10 inches in length and of the caliber of a No. 8 catheter. The end is closed with a ligature and a small oblique incision is made with scissors as near the closed end as possible, making a small valve with apex directed towards the closed end, and at its base dividing one third of the circumference of the tube; the more oblique the incision the better.

This incision acts as a valve, opening under slight pressure from within the tube and preventing any regurgitation of pus or irrigated fluid. The tied end of the tube should be inserted to the depth of the wound and the free end left projecting through the dressing, one or two tubes sufficing for most wounds.

In cases of perforating wounds of the limbs, or wounds with two openings, the tube is ligatured at its center and a valve cut on each side of the ligature pointing toward it. The tube is passed through the wound and irrigation carried on from both ends.

To secure the tubes in position the author recommends a small independent incision through the skin near the edge of the wound just large enough to grip the tube without occluding its lumen; through this the free end is drawn after the tied end has been inserted to the bottom of the wound. The free ends of the tube are left outside the dressing and irrigation is carried on with a glass syringe.

The author has had very gratifying results by injecting 1 to 2 drams of 1 in 1,000 flavin twice in 24 hours. He believes that some of the best results were obtained where the drainage from the wound was not free, the antiseptic fluid being then brought in contact with all points of the suppurating surface.

V. C. HUNT.

Turner, P., and Richardson, G.: The Treatment of Wounds Infected with *Bacillus Pyocyaneus*. *Brit. M. J.*, 1917, ii, 421.

Bacillus pyocyaneus infection at the front is fairly common. The infection may be primary, the pus being bluish-green from the onset, or it may become infected later, when the wound has apparently begun to granulate. It may develop secondarily from infected instruments, apparatus, etc. The suppuration is profuse, bluish-green and offensive. It may be associated with an intractable diarrhoea presumably from a septicæmic infection of the intestinal tract. While not dangerous to life, healing of a wound is often greatly impeded. Isolation into separate wards practiced in some hospitals is unnecessary if ordinary precautions are taken to prevent contact transmission.

In some cases in which a *bacillus pyocyaneus* cannot be shown, the characteristic pus may be due to diphtheria organisms, or *bacillus pyocyaneus* may be present but its growth inhibited by other organisms. On the other hand, the organism may be present without producing colored pus. It may also disappear suddenly, especially in shallow superficial wounds, indicating in such cases a low degree of virulence.

In 1915 the wounds were treated with cold eusol solution without much benefit. Hot eusol has since been found to be very effective, superficial wounds clearing up often in 24 hours. The disappearance of the green color is probably due in large measure to the bleaching action of the eusol, as it has this action *in vitro*, but cultures from wounds in which hot eusol has been used have lost their color and numerous subcultures are necessary and sometimes unsuccessful in restoring color-forming properties of the organism.

The eusol is applied in 5 per cent solution as hot as can be endured and changed every four hours. Deep wounds and sinuses may be syringed out twice daily, or packed with gauze containing eupad powder and moistened with eusol. C. A. HEDBLUM.

Sweet, J. E.: Dichloramin-T in the Treatment of the Wounds of War. *J. Am. M. Ass.*, 1917, lxix, 1076.

The chlorin compounds which have been derived from the old Labarraque's solution seem to have given, in general, the best results in the treatment of wounds of the present war. These chlorin-containing solutions, variously known as eusol, Dakin's solution and Daufresne's solution, have suffered from two serious faults. They are not particularly stable and must be prepared with care. Further, these solutions contain so little antiseptic value that they must be frequently renewed in the wound.

This new dichloramin solution is made by dissolving the crystals of dichloramin-T in chlorinated eucalyptol and then diluting this solution by the addition of chlorinated paraffin oil. It is best applied by an oil spray, an ordinary hard rubber or all-glass atomizer being the most practical method. Metal atomizers are not suitable since the metal is attacked by the chlorin.

This oily solution presents the first great advantage in that the dressings do not stick to the wound and the entire act of dressing is relatively painless. The old dressing is simply lifted off and the wound sprayed; the force of the spray will dislodge sloughs and the wound is covered with a fresh dressing.

The solution contains enough available antiseptic so that one dressing every twenty-four hours is ample for large, deep wounds, and one dressing every forty-eight or seventy-two hours is enough for the simple or more superficial wounds. Since the solution contains so much available chlorin and does not have to be renewed every few hours, the use of the Carrel tube is entirely done away with.

Dakin's dichloramin-T in solution in eucalyptol and paraffin oil is, therefore, of great advantage in wound treatment, because:

1. It saves the pain of wound dressing.
2. It effects an appreciable saving of dressing material.
3. The amount of solution is of small bulk.
4. The number of wounds which a surgeon can dress in a given time is far greater than by any other method.
5. The elimination of the Carrel tube simplifies the dressing and the problem of transportation of the wounded.
6. The elimination of the Carrel tube saves the time taken by the nurse for the periodic flushing.

EDWARD L. CORNELL.

Smith, J. L., Ritchie, J., and Rettle, T.: A Convenient Method of Preparing Eusol. *Brit. M. J.*, 1917, ii, 386.

Eusol may be prepared in the following way, according to the authors:

"Take 135 ccm. of the B.P. liquor calcis chlorinatæ, dilute with water to 1 litre, add 10 grams of boric acid, and shake up till dissolved. The solution remains clear, and without further treatment is ready for use. If preferred, a saturated solution of boric acid may be stocked at room temperature; this contains 4 per cent boric acid, therefore 250 ccm. gives the amount required for 1 litre eusol. In making eusol in this way the 135 ccm. of liquor calcis chlorinatæ should be diluted to 750 ccm. and the 250 ccm. of boric acid solution added. This prevents the formation of the precipitate which occurs if boric acid be added to undiluted liquor calcis chlorinatæ."

Liquor calcis chlorinatæ is a 10 per cent solution of bleaching powder in water; this is easily prepared and keeps well. The quantity is calculated on a chloride of lime assaying 25 per cent available chlorine; which is about the average obtained from commercial samples.

Should eusol be required for intravenous infection, it is necessary to add sodium chloride in the proportion of 8.5 grams to the liter. C. A. HEDGECOCK.

ANÆSTHETICS

Elmer, W. G.: Anæsthetics in Orthopedic Surgery. *N. Y. M. J.*, 1907, cxi, 591.

The condition of the patient's heart, lungs, kidneys, blood and blood-pressure should be ascertained before the operation. Administration of the anæsthetic should not be started until all the preparations for the operation are complete. Nothing is to be gained by keeping a patient anæsthetized while the surgeon is completing an operation on a previous patient. This extra prolongation of anæsthesia may be the determining factor between a normal convalescence and an ether pneumonia or a nephritis. Great care should be exercised in and during the administration of any

anæsthetic, as death is recorded as having occurred in the case of a child who was lightly anæsthetized for only a few minutes for a tenotomy of the Achilles tendon. The patient was a ten year old boy with a spastic cerebral paralysis.

As a pure anæsthetic, chloroform is the ideal one. It has, however, a higher mortality rate than ether and should be considered a poison. It has a limited field. Ethyl chloride is still more dangerous, although as an anæsthetic it ranks with chloroform. The choice, therefore, lies between ether and nitrous oxide-oxygen. The latter in experienced hands is the safest anæsthetic and in several instances has been given continuously for three and one half hours.

In orthopedic operations the patient is kept very lightly anæsthetized, so that by the time the operation is about over, he is turning his head, opening his eyes, and responds when spoken to. The anæsthetic is not continued during the application of a plaster of Paris bandage. The author almost never sees a patient go into shock. In weak children a slight amount of pain may act as a stimulant. But if the pain becomes too severe, it adds to the shock.

In operating upon a child with tuberculosis of the spine, great care should be exercised in handling the child, as under anæsthesia the voluntary muscular control is lost and therefore there is no protection to the spine. An abscess may be ruptured at the seat of the disease, causing sudden or ultimate death. Even the spine itself may be fractured. The author knows of such a case. The general mortality of this operation is about five per cent. With careful handling the mortality should be reduced about one-half. In conclusion, the employment of skilled anæsthetists, careful handling, etc., will result in the saving of many lives annually.

J. J. KURGANOFF.

Cotton, J. H.: Anæsthesia from Commercial Ether Administration and What It is Due To. *Canad. M. Ass. J.*, 1917, vii, 769.

In a preliminary report of his studies on the anæsthetic effect of ether, Cotton draws the following radical conclusions:

1. Absolutely gas-free ethyl-ether is not anæsthetic.
2. It acts only: (a) as a vehicle for analgesic gases existing as impurities in commercial ether, carbon-dioxide, ethylene, etc.; (b) as a narcotic stimulant.

A. EHRENFRIED.

SURGICAL INSTRUMENTS AND APPARATUS

Butler, E.: Use of the Aspirator for Removing Pus, Blood, Exudate, Transudate, and Bowel Contents During Operations. *Calif. St. J. Med.*, 1917, xv, 376.

The removal of blood and mucus from the pharynx during operations in the nose and throat by means of some suction apparatus is an accepted

procedure. However, the use of suction apparatus by the general surgeon has been neglected. This method of removing blood, pus, exudate, transudate, cyst contents, and bowel contents is very practical and efficient.

The apparatus first introduced by Sewall of San Francisco is easy of construction, not costly and is reliable. It consists of an ordinary glass connecting tube the size of a lead pencil, tipped with three-fourths of an inch of fairly stiff rubber tubing; the glass may be bent to any angle. Six feet or more of pliable but not easily compressible rubber tubing connects this tube with a five gallon glass jar. The jar is connected with an ordinary water pump aspirator attached to a water faucet. This gives a partial vacuum of sufficient, even aspirating force to

carry away fluids encountered while operating. The tubing and jar are easily sterilized.

The field for the use of the aspirator is not limited to the nose, throat, and the abdomen. Any operative procedure where the wound is deep and the bleeding is free is benefited, such as operations upon malignant growths in the region of the orbit or superior maxilla, tumors of the tongue, and sub-sternal goiter. In surgery of the long bones, where fewer sponges and instruments lessen the likelihood of infection, the aspirator may be used with great advantage.

The aspirator is not heralded as a substitute for sponges, but it has a definite place in surgery and every operating room should possess one.

ISIDORE COHN.

SURGERY OF THE HEAD AND NECK

HEAD

Ostrom, L.: Depressed Nasal Deformities Corrected by Bone Transplantation. *Illinois M. J.*, 1917, xxxii, 169.

The author believes that the best operation for depressed nasal deformities is that worked out by Carter.

The nasal cavities are packed with cotton saturated with paraffin vaseline beyond the nasal bone. Incision is made between the upper and lower cartilage in the left nostril. The periosteum over the nasal bones is incised one-eighth of an inch from the lower edge all the way from the right to the left side. It is then elevated, leaving until the last the attachment over the intranasal suture. The periosteum is cut off close to the bone, care being taken to avoid tearing or splitting.

In the meantime the assistant removes a portion of the ninth rib, about two inches of bone and one-half inch of attached cartilage. This is split and one-half is shaped and adjusted into the cavity prepared for it, the tip of the nose being stretched to admit the cartilaginous end. There is no stretching of the skin or intranasal incision if the transplant is of proper size.

H. J. VAN DEN BERG.

Leriche, R.: The Syndrome of the Superior Petrous Sinus with Regard to a Case of Dry Jugulo-Carotid Shell Wound (Le syndrome du sinus pétreux supérieur à propos d'une observation de plaie sèche jugulo-carotidienne par éclat d'obus). *Lyon chirurg.*, 1917, xiv, 728.

Leriche relates a case in which a soldier had the external carotid at its emergence and the internal jugular torn by a fragment of shell. The double lesion was unaccompanied by the least hematoma. The man was operated three days after injury and the injured vascular segments which were embedded in pus were resected. The postoperative course was regular until the twenty-fourth day when a curious

complication arose. The patient had taken a walk in the sunlight and suddenly experienced a severe and rebellious neuralgia of the trifacial nerve, followed six days later by a purulent discharge from the left ear. A thorough examination of the ear and mastoid region gave negative findings. Meningitis symptoms appeared and the patient died in coma.

Postmortem examination showed a suppurative phlebitis of the coronary sinus in communication with the brain membranes. The cavernous sinus and the petrous sinuses were intact.

Referring to the anatomical relationship of the superior petrous sinus with the trifacial nerve and tympanic cavity, Leriche believes that the trifacial neuralgia and the aural symptoms may be satisfactorily explained as venous stagnation of the petrous sinus and may represent the clinical features of a disease of the superior petrous sinus which, as far as he knows, had not yet been isolated.

W. A. BRENNAN.

Bennett, N. G.: War Injuries of the Jaws. *Practitioner*, Lond., 1917, xcix, 201.

War fractures differ from ordinary fractures by loss of bone involved. Early treatment is often simply palliative. It consists of control of hæmorrhage, support of fractured bone, and abatement of sepsis. Loose or broken teeth to which splints may later be advantageously attached are left in place.

The ultimate treatment depends on the site and extent of injury. With loss of bone exceeding three-quarters of an inch, bone graft will be necessary. It is not desirable to sacrifice normal position to obtain bone union.

Various appliances are used for reduction and immobilization. Some are applied to one jaw only, usually the mandible; some include the opposing jaw and are used when lateral deviation of half the jaw has occurred; while others have an external

appliance firmly fixed to the head for correction of displacement of the maxilla.

Of surgical measures there are two possibilities, viz., plating and bone grafting. Plating is seldom used. Bone grafting, however, has been quite successfully employed. H. J. VAN DEN BERG.

Shambaugh, G. E.: Carcinoma of the Maxillary Sinus. *Surg. Clin. Chicago*, 1917, 1, 831.

Shambaugh reports the case of a man 60 years of age who complained of a sensation of pressure on the right side of the face. This first appeared a few weeks before examination, following an acute head cold. There was no increase in the nasal discharge. He had had a maxillary sinus infection some 40 years previous. There was no external evidence of right maxillary sinus trouble, no nasal discharge of a chronic type, and no nasal evidence of sinus infection. Transillumination gave a deep shadow of the right maxillary sinus. A puncture was made in the middle meatus and clumps of thick mucopurulent secretion were washed out similar to that following subsidence of an acute sinus reaction. Decayed right upper molars were removed. The Wassermann test gave negative results.

In two months the patient returned with loss of weight and distinct cachexia. The right eyeball was fixed and protruded somewhat, and the sight in this eye was gone. Intranasally there was no evidence of trouble. From the unhealed tooth sockets exuberant newly formed tissue protruded and microscopic examination of portions of this growth showed it to be carcinoma. The right superior maxilla was removed, but the patient died about one week later. CARL R. STEINKE.

Vaughan, G. T.: Injection of the Gasserian Ganglion for Neuralgia of the Fifth Cranial Nerve. *Ann. Surg.*, Phila., 1917, lvi, 287.

The author reports three cases of injection of the gasserian ganglion with complete relief at least three months after each operation. He urges a more thorough trial of this method of treatment in cases of tic douloureux because of its comparative freedom from risk and its relative simplicity. The method was suggested by Ostwald and Sicard in 1906, and Pusep, in 1911, made the first, though unsuccessful, attempt to use it. There may be some question as to whether it should be preferred to the Frazier-Spiller operation, as the latter preserves the motor functions of the nerve. However, no operation is as safe as injection; only one death has been reported to date, and that probably was due to an error in technique. The danger of injuring some of the important structures is great, but experience shows that even if such injuries are inflicted, they do not seriously injure the patient. The author has used 1 ccm. of 95 per cent alcohol in his cases. GATEWOOD.

Holt, L. E.: Gliosarcoma Resembling Hydrocephalus in An Infant of Seven Weeks. *Am. J. Dis. Child.*, 1917, xiv, 219.

The infant, 7 weeks old, was admitted to the Babies' Hospital, New York, Jan. 16, 1917. He was a full term baby of normal labor, and had been breast fed to date of admission. The family history was negative. When about two weeks old the parents noticed that the head was enlarging rapidly. A little later the veins of the scalp began to grow very prominent. Both of these symptoms had increased steadily up to date of admission.

The head was asymmetrical, with a very large prominence in the left frontal region. The scalp was covered with a network of enormously dilated veins. The skin of the scalp was tense and shining, especially over the most prominent portion. The sutures were widely separated. There was slight internal strabismus and occasional nystagmus; the conjunctivæ were normal; there was no evidence of paralysis.

The head continued to increase greatly in size. A spinal puncture showed a fluid under increased pressure containing 120 cells per cmm., 63 per cent of these being polymorphonuclears and 37 per cent lymphocytes; the globulin test was positive. Over the frontal eminence the scalp became very tense and thinner, until on the eighth day a spontaneous rupture took place over this prominence, followed by a discharge of cerebrospinal fluid, the amount of which probably did not exceed 150 ccm. The rupture was followed by a protrusion of brain substance, a true hernia cerebri.

At necropsy the head measured 48.5 cm. in circumference. There was a rupture in the scalp and dura through which protruded cranial contents forming a mass 8 by 5 cm. in size and weighing 135 gm. The cerebrospinal fluid was but slightly in excess, not over 90 ccm. being present. The dura showed many punctate hemorrhages. The brain had marked asymmetry, the left hemisphere being fully three times the size of the right. The tumor mass involved practically the entire left hemisphere; it was a soft, lobulated new-growth containing in its substance many softened areas, many recent hemorrhages and yellow pigmented remains of old hemorrhages.

A microscopic examination of the tumor showed it to be a gliosarcoma. A complete autopsy was made, but the examination of the other organs showed no new-growths or any other lesions having any relation to the cerebral condition.

EDWARD L. CORNELL.

Hunt, J. G.: The Open-Flap Method of Treating Perforating Brain Wounds. *Lancet*, Lond., 1917, cxviii, 464.

This method is based upon sound elementary surgical principles, i.e., unobstructed drainage and minimum interference with the damaged parts at time of operation and during the subsequent weeks of healing.

The first step consists of turning down a good-sized flap of scalp with perichondrium sufficient to expose freely the whole area of bone injury. The wound in the bone is enlarged and all depressed fragments removed, and in addition a margin of healthy dura surrounding the damaged portion of the membrane is exposed. The wound in the brain and dura is disturbed as little as possible. Foreign bodies, if superficial, are sought for. When the brain is much damaged, the opening in the dura, if small, should be freely enlarged by radiating incisions.

A strip of iodoform gauze is firmly inserted between the dura and the over-hanging edge of the bony hole. It shuts off the general meningeal space from the infected wound, and stimulates the formation of the natural barrier of adhesions between the coats of the dura. A loose pad of fluffed iodoform gauze is lightly packed over the whole denuded area.

The scalp flap may then be loosely replaced over the gauze, or it may be held down out of the way by one or two silkworm sutures. The outer dressings are of plain gauze moistened with saline or boric solution, and should be changed twice daily. The iodoform gauze must not be disturbed for from 5 to 7 days. At this date the hernia cerebri will be found well developed. In none of the cases of hernia was there more than one diopter of disc swelling at any stage. The author believes the formation of hernia is due to local increased vascularity, inflammatory edema, and round-celled infiltration.

In a large number of cases seen by the author in which the flap was resutured with or without drainage tubes, there was a latent period of hopeful convalescence of from seven to ten days, followed by a sudden rise of temperature and early death from meningitis. The postmortem showed that the soft necrotic brain matter composing the hernia had spread out beneath the skin flap and had become virulently infected.

The hernia reaches its maximum size about the end of the second week and then slowly recedes, so that in four to six weeks it no longer projects above the bony parts, and the whole wound will be covered by healthy granulation. The skin flap may then be safely replaced.

The author states that in more than 50 cases of his own knowledge the results, as regards life-saving and ultimate restoration of function, have proved far better by this than by any other method adopted.

V. C. HUNT.

Kalb, O. : Ablation of Portions of Altered Cerebral Cortex in Epilepsy. *Deutsche med. Wchnschr.*, 1917, No. 5.

While there is much difference of opinion as to the value of surgical intervention in genuine epilepsy, there is general agreement with regard to its efficacy in traumatic and reflex epilepsy.

The author operated in the case of a boy 14 years old who for ten years had been epileptic. There

was a history of infantile cerebral paralysis. During the past year he had two or more fits each week.

Under local anæsthesia the author uncovered the left cortical motor zone and opened the dura. There were no adhesions. On the superficies of the brain or the central anterior and posterior convolutions, especially toward the median line and toward the base of the brain, there were alterations in the cerebral cortex. There were numerous brown-red patches of infiltration containing in certain parts small cysts.

As a complete extirpation of the altered zone would have resulted almost certainly in a total paralysis of the right limb, the author proceeded to dissect out from the altered parts small islets varying from the size of a lentil to a pea and for a depth of 5 mm. About a dozen such were removed, constituting about two-thirds of the altered parts of the grey matter. Islets of normal cortex remained. There was some language disturbance following operation, but after a week this as well as the limb paralysis improved. After four weeks the patient could walk with the help of a cane. After one year and a half psychic phenomena have disappeared; the general intelligence is better and the patient can walk for some hours.

Although observation for one year and a half is not a sufficient interval to pronounce a definite cure, yet the probability of permanent recovery is very great and decidedly encourages the surgical treatment of these cases of cortical epilepsy at an early age, particularly when there is a history of infantile cerebral paralysis, as in the case reported.

W. A. BRENNAN.

Walker, C. B. : The Diagnosis of Pituitary Disorders. *Interst. M. J.*, 1917, xxiv, 817.

The symptoms of glandular disturbance result from disturbed secretions of one or both parts of the gland. The anterior portion is chiefly related to factors of skeletal development, while the posterior lobe is most closely related to metabolic processes, and the deficiency leads to noticeable increase in sugar tolerance, with a tendency to adiposity, subnormal temperature, somnolence, dry skin, polydipsia, polyuria, loss of hair and characteristic psychic disturbances.

Functional excess or administration of extracts causes loss of flesh, intolerance for carbohydrates, even spontaneous glycosuria, and moist skin; moreover, secondary derangements to other glands occur, more noticeably in the genital organs. Certain types suggest functional hyperplasia of one lobe with lowered activity of the other, or, at one period, over-activity, and later, deficiency of both lobes. Thus, pronounced acromegalias may show in a later stage a tendency to put on weight, high sugar tolerance, somnolence, sub-normal temperature and anaphrodisia, etc., while in earlier stages or in exacerbations of the disease there is apt to be a reverse picture, active metabolism, glycosuria, aphrodisia or hypertrichiasis,

etc. Again, in the type of Froehlich, there is a primary and chronic lowering of activity of both lobes. In this type of case the symptoms date from pre-adolescence, the stature remaining small because of anterior lobe complications, while adiposity, genital dystrophy, imperfect secondary sexual characteristics, lowered metabolism, etc., indicate posterior lobe obstruction.

Cushing also has described such cases with adiposogenital dystrophy, accompanied by skeletal over-growth. An internal hydrocephalus, pressing on the posterior lobe and depressing its activity but apparently stimulating the more protected anterior lobe, seems to be the exciting cause.

Although X-ray demonstrations of the enlarged sella turcica is a very reliable diagnostic point in determining the presence of strumous, tumorous or hyperplastic condition of the hypophysis, it should be noticed that many cases of dyspituitarism, especially in the last two groups discussed, may show no enlargement of the sella and yet may have a supra-cellular or interpeduncular or even a more distinct tumor giving glandular or ocular field manifestations without distorting the sella.

While the commonest ocular field defect accompanying hypophyseal growth is a bitemporal hemianopsia, this or the tendency thereto occurs only about twice as often as homonymous hemianopsia or the tendency thereto, in this group of cases. There are also many cases which become blind in one eye and have a temporal hemianopsia in the other. Unusual cases also have occurred which resist all attempts at classification. It must be remembered that ethmoidal and sphenoidal disease may produce central scotomata and develop field defects, and that glaucoma may also give temporary scotomata and defects between the macula and the blind spot.

True primary optic atrophies and toxic scotomata must also be differentiated. E. C. ROBITSEK.

NECK

Hagerty, J. F.: Oration in Surgery: Observations on the Thyroid. *J. M. Soc. N. J.*, 1917, XV, 341.

The author calls attention to the fact that the thyroid gland, though small and occupying an exposed position at the front of the neck, exercises a powerful influence upon the growth and well-being of the individual and that the secretions of this gland when altered or deranged have a serious effect on the health and frequently cause terminal changes which result in death. Normally about one-sixth of the blood supply of the head goes to the thyroid gland, and this is increased to one-fourth in cases of hyperthyroidism.

In spite of the fact that the thyroid has been studied since 1880, its true function and its relation to other glands of internal secretion is not yet definitely known. The thyroid begins as an evagination of the epithelium of the alimentary canal. This is a downgrowth from the pharynx which

develops at junction of the posterior and middle thirds of the tongue from which the lobed thyroid is developed. The site of thyroid Anlage evagination is marked by the position of the foramen cæcum. Various abnormalities may occur, such as a persistent thyroglossal duct and isolated masses of thyroid tissue which are frequently found along the trachea and bronchi.

It is known that the thyroid manufactures an internal secretion the absence of which causes a lack of mental and physical development. It is also known that the drinking water derived from certain geological formations may cause a disordered function of the thyroid, while boiling of the water reduces the proportion of goiter cases. This indicates that hyperthyroidism is an infection due to living organisms rather than the result of a mineral poison. Rosenow has stated that while bacteria can be cultivated from crushed tissue of diseased thyroids, yet infectious strumitis is very rare.

Hyperthyroidism is thought by some to be due rather to a perversion of function than to an increase of normal function. The degree of toxæmia is not always proportionate to the size of the gland, many of the severest cases showing slight, if any, enlargement. It is stated that 22 per cent of adenomata and 25 per cent of colloid goiters subsequently take on toxic degeneration. The degeneration of the gland may also cause pressure effects on the trachea. This, together with the fact that malignant degeneration may take place, would sustain the belief that some form of operative procedure is indicated in most cases.

It is agreed that complete physical and mental rest and the administration of such drugs as tend to relieve nervous symptoms are essential in the treatment of goiter. Seventy per cent of hyperthyroid cases can be cured, it is claimed, and 16 per cent benefited by operation. Various surgeons place the mortality of exophthalmic goiter at 25 to 35 per cent. P. H. KROENGER.

Barnett, G. D.: Some Unusual Aspects of Exophthalmic Goiter. *Calif. St. J. Med.*, 1917, XV, 342.

In exophthalmic goiter, attention has shifted somewhat from the field of diagnosis to that of pathogenesis. A considerable number of fairly well-marked cases of hyperthyroidism are not diagnosed because of the undue prominence of certain less common symptoms. The author mentions one case. In a young girl aged 21, who had a temperature of 103.4° and a white blood count of 9,600, a tuberculosis of the urinary tract was suspected because of frequent burning urinations. More careful examination showed a negative Widal test and negative guinea pig inoculations. It was found that the cystitis was due to the administration of large doses of urotropin. Prolonged rest, overeating, and the administration of hydrobromide of quinine gave practically complete relief from symptoms. Examination of the neck showed a moderately prominent thyroid.

In another case the rapid pulse, cardiac palpitation, marked tremors and some enlargement of the thyroid suggested at once the diagnosis of hyperthyroidism. Under treatment the patient improved quickly. A year later this patient again presented herself, this time with a continuing afternoon temperature as high as 102.5°, and a persistent cough. A leucopenia was present. In the absence of other positive findings, the patient was again put at rest, and all symptoms of hyperthyroidism disappeared. Without a definite knowledge of the first attack, one might well have been misled by the temperature chart. The high temperature may characterize different degrees of thyroid intoxication or may be due to an incidental intercurrent infection. If all cases of exophthalmic goiter are of infectious origin, the continued fever may be accounted for.

Certain cerebral nerve disturbances in hyperthyroidism may produce symptoms of myasthenia gravis, which conditions must be carefully differentiated. The author believes that the parathyroids may possibly play a rôle in the etiology of myasthenia.

P. H. KREUSCHER.

Sarkisiantz, A.: The Recurrence of Operated Goiter (A propos de la recidive du goître opéré). *Rev. méd. de la Suisse Rom.*, 1917, xxxvii, 525.

The author reports the details of 7 cases of goiter necessitating re-operation. The first operation was done according to the Ronx technique. He

draws the following conclusions as deducible in the case of nuclear goiters:

1. The anastomoses between the trachea and isthmus and those connected with the oesophageal arteries even after ligature of the trunk of the superior thyroid artery assure sufficient vitality to the rest of the thyroid body after ligature of the four thyroid arteries.

2. Ligature of the four or five thyroid arteries, with or without section of the vessel, gives no guarantee against a pseudo-recurrence.

3. This ligature causes a very abundant connective tissue formation.

4. The ligature may be followed by a vascular formation, often richer in appearance than the normal vessel, and in any case very difficult to overcome in a new operation.

5. It would seem that this new vascularization is the result of a process which is proportional to the extent of the operation and to the intensity of the immediate reparatory process.

6. A simple unilateral operation, but more complete, would give the patient a better chance of avoiding a secondary operation, if the question of esthetics is waived.

7. Various combinations of symmetrical or other ligatures do not give different results.

8. Multiple ligatures, owing perhaps to the abundance of the newly formed conjunctive tissue, predispose to early recurrence, taking the form of conglomerate cysts.

W. A. BRENNAN.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Elliott, T. R.: Results of the Treatment of Chest Wounds. *Lancet*, Lond., 1917, cxciii, 371.

The author analyzes the after-histories in England of 170 cases of chest-wounds which were seen by him at a base hospital in France during the first two years of the war. The cases consisted of the following groups: Sterile hæmothorax, 89; septic effusion, 64; clotted hæmothorax, later septic, 3; sterile pneumothorax, 6; severe laceration of the lung, 2; no effusion, 6.

The chief practical points of the paper follow:

1. A sterile hæmothorax of moderate size, i.e., of about 30 ounces, will recover as rapidly by natural absorption as by aspiration.

2. The retention of foreign bodies in the chest in aseptic cases does not appear to exert any crippling effect for military service.

3. Cases of infected hæmothorax that have been drained in France and transferred to England generally recover rapidly and completely. None die, and subsequent operations are rarely needed. More than one-half can be returned to duty.

4. The late mortality from chest wounds is practically nil in England, and it is only 5 per cent.

on the lines of communication in France; but in the area of the armies it is higher than was at first supposed. About 10 or 15 per cent may die in medical units at an early date from the severity of the injury, and about 10 per cent later at the casualty clearing station from complicating sepsis.

5. Among those casualties which develop sepsis within the chest the mortality is very high, rising to nearly 50 per cent under the present system of treatment by rib resection and drainage.

6. The old conservative routine of surgical non-intervention, except by late drainage, finds its justification only in the recovery of those cases of gunshot wounds of the chest which remain non-infected, about 75 per cent. The high mortality in those which develop sepsis demands a wider practice of the new prophylactic method of cleansing operations, performed at an early hour on carefully chosen groups of cases.

E. B. FREILICH.

Kosmak, G. W.: Report of a Case of Antepartum Mammary Due to Unrecognized Malignant Disease. *Am. J. Obst.*, N. Y., 1917, lxxvi, 444.

The author reports a case of antepartum mammary hyperæmia due to secondary carcinoma in the

liver, mesentery and mediastinum. Both breasts were very large from engorgement, tender, and painful. The veins over the breasts, chest, neck and arms were markedly enlarged. The skin was tense, smooth and inflamed. There was no fluctuation and nothing palpable in the axillæ. The abdomen was slightly distended with gas above the uterus. Vaginal examination was negative. X-ray pictures of the chest showed nothing abnormal in the mediastinum. The patient delivered herself spontaneously of a premature child which lived.

This case is interesting because of its course and variety. Mediastinal abscess, aneurysm, and sarcoma could be ruled out. The author finally concludes that it was primary intestinal carcinoma, with rapid extension into the mediastinal glands and tissue. Induction of labor when the child became viable would give immediate relief to the mother, but the condition appears hopeless.

W. L. BROWN.

Berard, L., and Dunet, C.: Rebellious Thoracic Fistulæ Due to Synostoses (*Les fistules rebelles du thorax bloqué*). *Presse méd.*, 1917, p. 545.

The author describes and illustrates several types of callus formed from nuclei of bone chips, etc., which result after thoracic or scapulothoracic fractures. Such a synostosing callus may involve several ribs and form what the author calls a costal callus "*en lunette*." Such a callus is often infected and causes the infection of the adjacent tissues, giving rise to rebellious thoracic fistulæ. Various modes of dressing, curetting, or other treatment fail to bring about recovery. Surgical intervention by a total resection of all the affected tissues is alone capable of effectively dealing with these fistulæ. The author describes his technique of incising the superficial and bony tissues and dealing with purulent collections.

W. A. BRENNAN.

Comblair and Hertz: Early Treatment of Septic Pleural Effusions Consecutive to Chest Wounds (*Traitement précoce des épanchements septiques de la plèvre consécutifs aux plaies de poitrine*). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1678.

In chest wounds showing neither fracture nor effusion, the authors have abstained from intervention. If there is a fractured rib or scapula they reduce the fracture and close. If there is a small foreign body, it is left; if the foreign body is of considerable size, it is extracted immediately if easily accessible. In other cases secondary extraction is preferred.

If there is pleural effusion which cytological and bacteriological examination shows to be septic, a low incision is made under local anæsthesia on the posterior axillary line and some centimeters of the ninth rib resected. Foreign bodies in the affected area are extracted. The pleura is then disinfected by means of an intermittent irrigation of Dakin's solution.

Fifteen cases were treated. There were 12 re-

coveries, 11 from pleural abscess, and 1 from sub-phrenic abscess. In 3 of these cases there was a subsequent reinfection of the operative wound which had to be disinfected and reclosed. This did not prevent complete recovery. Great prudence must be used in determining the time of suture. It is always necessary to wait until two or three successive examinations show the permanency of the sterilization of the wound before closing.

In recovered chronic cases radioscapy shows that the costo-phrenic angle is adherent and immobile, the diaphragm is raised even in forced inspiration, the lung does not penetrate the sinus, the thoracic amplitude is diminished, etc. In early operated cases the thorax preserves its form and almost normal limits, radioscapy shows a normal permeability of the lung tissue. The value of recovery appears therefore to be very much greater in early operation.

W. A. BRENNAN.

Cumston, C. G.: The Clinical Symptoms and Treatment of Hypertrophy of the Thymus Gland. *Med. Press & Circ.*, 1917, civ, 140.

The clinical symptoms of hypertrophy are: (1) functional, characterized by respiratory disturbances, as persistent dyspnoea, frequent suffocative spasms, usually nocturnal, and occasionally spasms of the glottis and stridulous laryngismus, (2) physical signs, as cyanotic facies, increased during paroxysms, distended superficial neck veins during paroxysm or on crying, forward vaulting of the manubrium, abnormal and asymmetrical forward projection of the upper costosternal area and dullness over the latter area. Radiography aids in the diagnosis. Radiotherapy may be used in the treatment which, however, is mainly surgical and may consist of exothympexy, resection of the manubrium and thymectomy with intracapsular enucleation, unquestionably the operation of choice.

H. H. FREILICH.

TRACHEA AND LUNGS

Patrick, J.: Rupture of the Left Bronchus from the Trachea. *Brit. M. J.*, 1917, ii, 359.

The author reports a case in which the patient fell from an empty service limber whose wheel passed over his chest; the patient died within seventy-two hours. Postmortem examination revealed a profound collapse of the left lung which was acutely hæmorrhagic, an acute generalized pericarditis, and separation of the left bronchus from the trachea, the tear being through the anterior portion to the extent of two-thirds of the circumference. No bruising or other evidence of injury were present on the skin.

H. H. FREILICH.

Mann, F. C.: Pulmonary Embolism. *J. Exp. Med.*, 1917, xxvi, 347.

The author divides cases of pulmonary embolism into three groups: (1) immediate death occurring when only a small portion of the pulmonary cir-

ulation is obstructed; (2) death caused within a few minutes and due to a complete or almost complete blocking of the pulmonary circulation; (3) delayed death, the result of an increase by thrombosis of an initial blockage by an embolus of a portion of the pulmonary circulation.

The cause of death in either group 2 or group 3 is very evident, he states. The mechanism by which death is produced by an embolus which blocks only a small part of the pulmonary circulation, group 1, is unknown.

The present investigation was made for the purpose of determining this unknown factor, a purpose the author has not been able to accomplish as it has been possible to produce death experimentally only by a more or less complete blocking of the pulmonary circulation. However, a brief report of the experiments Mann considers may be of value.

Most of the experiments were performed under ether anaesthesia, and the carotid blood pressure and respiration were recorded. The emboli were sent into the venous circulation through the right femoral vein, with the exception of a few experiments in which the left external jugular was used.

The emboli employed were of two kinds. One kind was made of paraffin with a melting point of about 43° C. It was found that ordinary Christmas candles offered ideal material for these. By using the different colors it was possible to make each embolus distinctive and thus to tell definitely the relationship between the time the embolus was sent into the circulation and the position in which it was found at autopsy. Furthermore, the melting point of the candle was such that it became soft and would readily mold at body temperature but did not form droplets.

The other kind of embolus was made from the animal's own blood. The left external jugular vein and the right femoral vein were dissected free for a portion of their course. Blood-vessel clamps were placed on them and the exposed portion of the veins was allowed to become distended with blood. It was then gently crushed with a haemostat, and after this a few cubic centimeters of tissue extract or blood serum from the same animal were injected into the damaged veins. Under these conditions large clots formed in the vessels very quickly. When the clamps were removed the clots were swept into the circulation, the process simulating the detachment of a thrombus in a patient.

The general results of all the experiments were the same. It was impossible to produce death or seriously imperil the life of the animal by emboli until the pulmonary circulation was greatly obstructed. Some emboli passed from the femoral vein to a branch of the pulmonary artery without producing any effects either on blood-pressure or heart-beat. Usually, however, there was a slight drop in the blood-pressure at the instant the embolus passed through the heart. This drop simulated that of a momentary inhibition of the heart, Mann states. Section of the vagi, however, did not prevent it,

and he considers that in all probability it was due to a passage of the embolus through the pulmonary valves. This was quickly recovered from, and the blood-pressure usually maintained a practically uniform level until many emboli had been sent into the circulation.

The first effect of the emboli that Mann noticed was an increase in the venous pressure. The abdominal veins stood out prominently, and small veins severed in the operative procedure which did not bleed at the time of section began to bleed after the passing of a few emboli. Later, blood-pressure decreased, in some experiments suddenly; in others it fell to zero slowly. The sudden drop was usually found to be due to a sudden blocking of the pulmonary artery, while in the gradual drop the emboli had blocked most of the pulmonary branches, and blood clots had formed around them. Respiration was unaffected until blood-pressure began to decrease. Then it usually increased in both rate and amplitude. The blood-pressure usually reached zero before respiration ceased.

Mann deemed it possible that general anaesthesia was a factor. To obviate this, in a small series of animals the operative procedures were done under local anaesthesia. The results were the same as when ether was employed.

In a few experiments the emboli were sent in under sterile conditions. When very many emboli were employed, the animal either died on the table or a short time afterward, or developed infarction of the lungs. When only a few emboli were employed the animal was not affected.

Death from pulmonary embolism, Mann states, usually takes place in relatively strong patients when they attempt to leave the sickroom at the beginning of convalescence. They are usually active at the time of death. To simulate this condition, a strong animal was fasted for several hours and the emboli passed into the circulation immediately after a period of intense exercise. The results of this experiment were also negative.

As a result of his experiments, Mann found that emboli made of paraffin and the animal's own blood sent into the venous circulation of dogs did not produce death until the pulmonary circulation was practically occluded, and the results were the same, whether the blood-pressure of the animal was normal or depressed by ether or disease, and whether the procedure was carried out under ether or local anaesthesia.

GEORGE E. BEILBY.

Ringer, P. H.: Analysis of Thirty Cases of Pulmonary Tuberculosis Treated by the Induction of Artificial Pneumothorax. *Am. J. M. Sc.*, 1917, div. 380.

The induction of artificial pneumothorax aims to compress the lung in an "air splint," this air splint consisting of nitrogen gas allowed to flow between the parietal and visceral layers of the pleura. Cases suited for this treatment are either those wholly unilateral or those with severe involve-

ment on one side and comparatively insignificant disease on the other.

In his work the author has used exclusively the puncture method of Forlanini. The procedure has been used in 30 cases. The following results were obtained:

1. Complete success in 7 cases, or 23.3 per cent.
2. Complete success in stopping hemorrhage in 3 cases, or 10 per cent.
3. Partial success, with treatment still in progress, in 2 cases, or 6.6 per cent.
4. Prolongation of life for an appreciable period in 4 cases, or 13.3 per cent.
5. Failure in 14 cases, or 46.6 per cent.

If headings 1 and 2 are considered together the percentage of successful attempts is raised to 33.3 per cent. In the series 4 cases were compressed to stop profuse bleeding and 3 of the 4 were complete successes. In the fourth case the bleeding was stopped but the patient was so exsanguinated that death occurred three days later.

Causes assignable to failure in 46.6 per cent of the cases are:

1. Pocket formation with surrounding adhesions so dense as to preclude any appreciable amount of collapse when a small amount of gas was injected, in 5 cases or 35.7 per cent.
2. Adhesions so dense as to obliterate pleural space in 3 cases, or 35.7 per cent.
3. Compression obtained to a decided degree, but no result apparent, probably because of deep-seated undiscovered disease in the opposite side in 2 cases, or 14.2 per cent.
4. Development of tuberculous pneumonia on the other side, in 1 case, or 7.1 per cent.
5. Exhaustion after obtained collapse with patient too near death to rally, in 1 case, or 7.1 per cent. Adhesions were responsible in 71 per cent of the failures.

V. C. HUNT.

PHARYNX AND OESOPHAGUS

Razzaboni, G.: Experimental Researches on Oesophageal Autoplastics (Ricerche sperimentali sull'autoplastica esofagea). *Polichin*, Roma, 1917, xxiv, no. 10, 417.

The author has already published the results of some experimental work on the possibility of free homoplastic cervical oesophageal grafting. His present experimental work deals with the possibility of repairing extensive losses of the oesophageal walls by means of free autoplasmic grafts of fascial muscular peritoneal strips. The experimental work has been done on dogs. A median laparotomy was done and strips through the recti muscles taken comprising peritoneum, aponeurosis and some muscular fascia. A part of the oesophageal wall was resected and the breach filled with the auto-graft marginally sutured with very fine silk. The strictest pre- and postoperative precautions were observed. Eight experimental tests were made.

From the results the author thinks that in the cases where an attachment of the autoplasmic grafts

was verified, the result must be interpreted as an indirect phenomenon. The experimental results cannot in truth demonstrate the persistence of the vitality of the transplanted tissue, but point rather to a probable autolysis. There can be demonstrated an activity and a profuse and very vascular connective tissue growth from the healthy oesophageal walls tending to invade the graft which apparently acts passively only.

But in every case it can be affirmed that a large loss of cervical oesophageal substance, such as is not susceptible of repair by simple suture, can be advantageously filled with a free autoplasmic graft of a fascial muscular peritoneal strip, which on being attached, renders the re-integration of the continuity of the oesophageal walls possible, and which is always followed by a more or less accentuated degree of stenosis. This, however, is not ordinarily sufficient to impede or at least to render very difficult the deglutition of ordinary food.

W. A. BRENNAN.

Friedenwald, J., Cotton, A., and Harrison, A. C.: Report of a Case of Huge Dilatation of the Oesophagus. *South M. J.*, 1917, 8, 717.

The author reports a case of very marked dilatation of the oesophagus in a brakeman, 40 years old, who had been troubled for eighteen years with regurgitation of food shortly after eating, and more or less so-called indigestion. X-ray examination revealed enormous dilatation with marked retention for 24 hours and to a slight degree for 48 hours. Attempts at dilatation of the cardia with olive bougies were unsuccessful, as the swallowed silk thread would not pass through the stomach, due to pylorospasm. Gastrotomy was done but the patient died. Autopsy findings demonstrated a fusiform dilatation of the oesophagus, which held 1,750 ccm. of water.

The unusual features of the case were: (1) the extensive dilatation of the oesophagus; (2) the inability of the silk thread to pass through the pylorus.

H. H. FREILICH.

Derr, J. S.: Cardiospasm Resembling Malignant Stricture of the Oesophagus. *Am. J. Roentgenol.*, 1917, iv, 477.

The patient complained of digestive and general disturbances which were thought to be reflex in character associated with an incipient carcinoma of the cervix uteri. After recovery from a panhysterectomy there was a recurrence of the old symptoms such as interference with the ingestion of food, inability to retain same, and loss of weight. A roentgen examination with an opaque meal revealed a constriction at the cardiac end of the oesophagus. There was much dilatation and retention was observed twenty-two hours after ingestion of the meal. A tentative diagnosis of organic stricture, probably malignant, was made. Treatment by bougie dilatation was practiced and another roentgen examination made nine weeks later. The plate again showed a residue of the meal in the

esophagus 30 minutes after ingestion nearly as large as in the first examination. A positive diagnosis of cardiospasm was made at this time and Plummer's hydrostatic dilator brought complete relief

after three treatments. A subsequent roentgen examination revealed no trace of the meal in the esophagus fifteen minutes after its ingestion. The patient is symptomatically well. ADOLPH HARTUNG.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Marotta, R. A., and Landivar, A. F.: *Cavernous Angioma of the Tendon of the Abdominal Superior Oblique Muscle* (Sobre un caso de angioma cavernoso del tendón del oblicuo mayor del abdomen). *Prensa méd. argent.*, 1917, iv, 107.

The authors relate a case of primary cavernous angioma of the tendon of the superior oblique muscle of the abdomen which he states is unique in medical literature. The only case approaching it is one reported in 1897 by Riethus in which there was a secondary angiomatous invasion of the Achilles tendon. In an article published by Weil of Breslau in 1913 mention is made of certain peritendinous angiomata, but in no case did the neoplasm invade the tendon, which could easily be preserved in the surgical removal of the tumor.

In the case reported by the authors the external oblique muscle of the abdomen showed in its tendinous part a tumor of ovoid form of soft consistency, the size of an almond, of clear azure hue, and firmly adherent to the tendon in the fibers of which it was intimately merged and not encapsulated. Its surface was irregular, due to the presence of a series of nodules of varying size. The case occurred in a woman of 23 years and was diagnosed before operation as a cavernous angioma of the muscles of the anterolateral abdominal wall. Histologic examination verified the nature of the tumor.

W. A. BRENNAN.

Graham, M. P.: *Tuberculous Peritonitis*. *J. Lancet*, 1917, xxxvii, 605.

Tuberculous peritonitis is either a chronic or an acute inflammation of the peritoneum caused by the tubercle bacillus, and characterized by more or less irregular clinical manifestations, such as pain, fever, tympani, tenderness and ascites.

The disease occurs as early as three years and as late as seventy years, most frequently between twenty and forty. It predominates in negroes. Women are more susceptible than men.

The tubercle bacilli may gain entrance to the peritoneum in five ways: (1) by lymphatics and glands; (2) through ulcers of the intestine; (3) through the intestine without any demonstrable atrium; (4) through the urogenital organs; (5) through the portal circulation.

The focus of infection is generally either the appendix, fallopian tube, lower ileum, or cæcum. Tuberculous peritonitis is more common in persons having foci elsewhere in the body.

Pathologically there are three varieties: the acute miliary type with serofibrinous or blood

exudation, the chronic ulcerative variety, and the chronic fibroid type with many adhesions and thickened peritoneum with increased blood supply and shreds of lymph.

The symptoms are variable; there may be no symptoms until the disease is well advanced. There may be only a languid, tired feeling, poor appetite and rather full abdomen. In a typical case there is afternoon temperature 101° to 104° , night sweats, loss of weight, large abdomen and usually abdominal pain or discomfort. Tympani is usually present except in cases where the ascites is great.

The diagnosis may be easy or difficult, usually aided by evidence of tuberculosis elsewhere in the body. The tuberculin test will help. The acute form must be differentiated from appendicitis, strangulated hernia, intestinal obstruction, and typhoid fever. The chronic forms must be differentiated from cirrhosis of the liver, ovarian cyst, and cancer of the peritoneum.

The prognosis depends upon the extent of the infection, virulence of the organism, the resistance of the patient, and the amount of associated tuberculous lesions elsewhere in the body. Fifty per cent are cured by medical measures and a large part of the remainder by surgical intervention. The mortality is high in those cases in which a generalized miliary tuberculosis is found.

The treatment, whether medical or surgical, should be on the general principles of treatment of tuberculosis. The good results of surgery are due to removal of the focus of infection, release of tension and extra fluids, and stimulation of the peritoneum to greater bacteriolytic activity. Opening the abdomen and emptying it of its fluid aids in the recovery, and 60 to 70 per cent of tuberculous peritonitis can be cured by surgery.

Some operators favor operation with drainage, others without drainage; the majority favor the latter view. From a prognostic standpoint it is important not to get a secondary infection or a fecal fistula. The focus of infection, such as the appendix, tube, etc., should be removed. Kelly recommends four grains of iodoform in the abdominal cavity; Davis uses one ounce of 1 per cent formalin in glycerine.

It is agreed that tuberculin is as valuable for tuberculous peritonitis as tuberculosis elsewhere. There are two methods of controlling its use, by the opsonic index and by temperature control. In the opsonic index method the dose is begun very small, and doubled each time. It is given daily, every second day, or semi-weekly, as long as the temperature rise is not too great and the opsonic index is

increasing. In the temperature control method continued small doses are given. It is claimed to be just as effective and more safely administered. St. Clair never went over 1/300 mg. and rarely over 1/500 mg. Some give about 2 mg., and even as high as 10 cc. have been given. The rise in temperature occurs within forty-eight hours after the injection. If there is no fall in temperature after seventy-two hours the tuberculin should be discontinued. If the amount of albumin in the urine remains low or is decreasing, the tuberculin dosage can be increased.

Contra-indications for use of tuberculin are: (1) weak and emaciated patients; (2) mixed infection cases of the third stage; (3) hemorrhages; (4) heart disease; (5) marked increase of pulse rate continuous with its use; (6) marked loss of weight with its use; (7) complications, as diabetes, nephritis, cirrhosis, etc.

Peritonitis, joint tuberculosis, lymph gland and meningeal tuberculosis, and lupus should be treated with Koch's old tuberculin, while pulmonary tuberculosis is probably not so much benefited by old tuberculin.

Mendel advocates arsenic with tuberculin. Murphy states that tuberculin and the X-ray was the treatment of tuberculous peritonitis in many cases. Bandlier in 500 cases with tubercle bacilli in sputum reports that the sputum was negative in 64.9 per cent of the cases after six months of tuberculin treatment.

Tuberculin acts as a whip to the natural powers of protection. About 0.001 mg. of old tuberculin is a safe beginning dose. The dose can be safely doubled till 0.1 mg. is reached and then raised cautiously to 1 mg. if there is no reaction. The reactions are general, focal and local. The aim is to get the greatest amount of focal reaction without general reaction. V. C. HUNT.

Ruffo, V.: Surgical Treatment of Tubercular Peritonitis (Trattamento chirurgico della peritonite tubercolare). *Riforma med.*, 1917, xxxiii, 636.

Ruffo gives a short historical résumé of the surgical treatment of tubercular peritonitis since Spencer Wells in 1861 performed the first laparotomy for this condition.

The author gives the details of two cases operated by Salvia in 1894 for tubercular peritonitis; one of these cases was of encysted form. The author reports both these patients now in perfect health.

While surgeons today are all in accord with regard to intervention in peritoneal tuberculosis, there is disagreement as to the procedure to be followed, whether simple puncture, simple laparotomy or laparotomy with consecutive peritoneal lavage.

Cecherelli attributes vast importance to lavage and considers it absolutely necessary, as it is the fundamentally useful factor in the surgical act. Ruffo, however, holds that lavage, though not possessing the great value attributed to it by Cecherelli, is yet harmless unless substances are

used which upon absorption may be detrimental to the organism. It may be used in every anatomic variety of tuberculous peritonitis and is absolutely indicated in these forms in which purulent diffused or circumscribed collections accumulate toxic matters. If not yet absorbed, these are easily removed by peritoneal lavage.

The author reviews the various substances used in peritoneal lavage, also the various anatomic and clinical varieties of tubercular peritonitis. He is inclined to think that operation is indicated in all forms except where the tuberculosis involves the lungs or is spread to many viscera or where the general state does not permit an operation.

W. A. BRENNAN.

Wohl, M. G.: Carcinoma of the Umbilicus. *Boston M. & S. J.*, 1917, cxxvii, 442.

The author reports the case of a woman 62 years of age who for about six months had observed a tumor growing at the umbilicus; it had grown to the size of an orange. The patient had been constipated for several years and had been troubled with a good deal of belching but no vomiting. She had lost 20 pounds in weight during the previous six months. The mass which was adherent to the transverse colon was removed, necessitating the removal of 8 inches of the colon. Ileocolostomy was performed. A mass the size of a duck's egg, cauliflower in appearance, was removed from the sigmoid, where it was implanted without involving the intestinal wall. The patient died of peritonitis. Microscopic examination proved the tumor to be an adenocarcinoma. It was secondary in the umbilicus from the intestine. CARL R. STEINKE.

GASTRO-INTESTINAL TRACT

Rehfuss, M. E.: Gastric Infection. *Med. Clin. N. Am.*, 1917, i, 333.

There are four reasons why the stomach normally resists infection:

1. The acid secretion is inhibitory, if not actually destructive, to bacterial growth.
2. A thin, mucoid protection to the mucous membrane serves as a barrier against infection.
3. The organ in health is constantly shifting its contents, so that the infected material introduced fails to gain a foothold on the gastric wall.
4. The excessive vascularity of the gastric wall, with its cavity, gives an efficient drainage on all occasions.

Probably the most important single condition which is conducive to infection is the reduction or disappearance of gastric acidity.

The author reports the case of a patient whose chief complaints were swollen feet, and distention and belching after eating, but no actual pain, nausea, nor vomiting. He had lost 25 pounds during one year, his appetite was poor and he had become obstinately constipated. A few weeks previous a diffuse purpuric eruption had occurred on the arms and legs.

Examination disclosed two important points, a more or less generalized purpura, particularly severe in the lower extremities, and a general tenderness in the epigastrium, not confined to any one point and unassociated with muscular rigidity. All the fractional specimens, without exception, contained large numbers of bacteria practically identical, a Gram-negative, non-motile bacillus. The persistence of the presence of organisms in different samples, their similarity in each instance, the presence of the organisms after lavage, and the evidence of direct mucosal disturbances, seemed to indicate the stomach as the primary or, more probably, secondary focus of infection.

The fractional tube not only lends itself to a diagnosis of this condition, but it paves the way for a rational treatment. If there is infection, two methods suggest themselves, i.e., the use of direct disinfection, and the isolation of the causative organism and the preparation and administration of a vaccine. Both of these methods have been used by the author, and in practically every case he has resorted to the first method. On a few occasions vaccines have been prepared. In one case due to a catarrhal infection, the effect was most favorable.

The method of gastric disinfection is as follows: The fractional tube is passed into the empty stomach and the entire residuum removed. The stomach is then irrigated with an alkaline solution of bicarbonate of soda or a weak solution of the various alkaline antiseptics, such as liquor antisepticus alkalinus, and finally by distilled water. This is followed by the direct instillation of the disinfectant into the stomach through the tube. For this purpose nitrate of silver, the colloidal iodide of silver, argyrol and protargol is used, as well as hydrogen peroxide. The first two have commended themselves to the author. He uses $\frac{1}{2}$ gr. of nitrate of silver in several ounces of water, allowing the solution to remain five or ten minutes in the stomach, after which part of the solution introduced is aspirated and the rest allowed to remain and exercise a continued action in the stomach.

EDWARD L. CORNELL.

Kelly, D.: Some Notes on Cases of Perforated Gastric and Duodenal Ulcers. *Med. J. Australia*, 1917, ii, 163.

The author observed ten cases of perforated gastric and duodenal ulcers occurring in males between the ages of twenty-four and forty-nine. All gave a history of chronic indigestion. The symptoms as stated were associated with periods of remission, and all were relieved by the ingestion of soda. Vomiting was not an associated symptom. The perforations were induced by overfilling the stomach with food or drink. Sudden acute abdominal pain was the first symptom, followed by rigidity of the abdomen.

Before opening the peritoneum the space above it was filled with saline solution, and the peritoneum

was nicked; if perforation of any hollow viscus occurred, gas was seen to bubble through the saline. In the author's cases, the perforations were all on the anterior wall, five on the stomach, three on the duodenum. The author does not recommend gastrojejunostomy, but performs it later if there are indications of obstruction. Excision was not done; closure of the perforation by Lembert's suture, swabbing out the abdomen and drainage were practiced in his series of cases. One patient had suffered from hiccough for fifteen hours, but was relieved after removal of the drainage tube, which the author believed produced pressure on the diaphragm.

M. A. BERNSTEIN.

Wilensky, A. O.: A Consideration of the Causes of Recurrent Symptoms After Operation for Gastric and Duodenal Ulcer. *Am. J. M. Sc.*, 1917, cliv, 387.

All postoperative symptoms after gastro-enterostomy for ulcer of the stomach or duodenum are not necessarily caused by the persistence of the original ulcer or the recurrence of it or similar new ulcerations; they arise much more frequently from other causes.

Symptoms may be due to disturbances in the physiology brought about by new anatomical arrangements; these are usually initiated or aggravated by poorly prepared or ill-suited food. Symptoms are also due to disturbances in healing of the stoma, to badly placed or improperly made stomata, or to partial or complete obliteration of the stoma when stomach has been unilaterally excluded.

Symptoms are due also to associated lesions in other organs; or to lesions in the spinal cord or peripheral nerves, as the vagus. They may also be due to adhesions or herniæ in the abdominal cavity or in the abdominal scar.

On the whole these may be classified as arising from an anatomical or functional cause, and frequently it is difficult to make the decision before an exploratory operation is made.

Pauchet, V.: Surgical Treatment of Gastro-Coloptosis (Gastro-coloptose; traitement chirurgical). *Rev. gén. de clin. et de thérap.*, 1917, xxxi, 545.

While abdominal ptosis may be general, a ptosis by descent of the stomach and transverse colon is more frequent. This is the form especially dealt with by Pauchet. It is more prevalent in woman and is principally due to corset-wearing, pregnancy, or thinness. In obesity the abdominal organs are in a state of equilibrium. When fat disappears there is too much space in the abdomen, the ligaments stretch and the viscera fall. The gastro-coloptosis syndrome, — constipation, cardialgia, dyspepsia, loss of flesh and neurasthenia, is the consequence of the fall of the viscera and is principally due to traction on the solar plexus and on the descended intestine.

The author discusses some types of gastro-coloptosis and the pathological conditions which it may simulate.

For the relief of this condition several surgical

methods have been suggested, viz., gastrohepatic suspension, great omentum suspension and gastropexy. This last method has been practiced several hundred times by Rovsing with encouraging results.

Pauchet has followed Rovsing's method in 25 cases. The abdominal incision is made under local anæsthetic followed by exploration and colocolic exposure of the posterior face of the stomach; fixation of the transverse colon to the large curvature of the stomach is done; the sutures are passed into the wall of the stomach and then into the abdominal wall and fixed. Results have been good in his cases. There was only one death due to acetonaemia and anuria. Rovsing had a mortality of 1.7 per cent. As regards end-results, both Rovsing and Pauchet found that three-fourths of their patients recovered sufficiently to resume their normal activity. Half were cured of constipation by operation. In the others massage, gymnastics and paraffin injections have been necessary.

Pauchet concludes that gastropexy gives very good results in three-fourths of the cases. Of the remaining one-fourth there is no result in one-half, and the other half show some improvement.

W. A. BRENNAN.

Torrance, G.: Intussusception in Children. *N. Y. M. J.*, 1917, cvi, 400.

Intussusception is essentially a disease of childhood. The diagnosis can frequently be made from the mother's story. The sudden onset of symptoms, vomiting, pallor and sudden acute pain in the abdomen, and usually in the first twelve hours the appearance of blood in the stools will differentiate this lesion from colitis, the only condition to be ruled out.

X-ray pictures may be used to show the intussusception. The tumor felt by rectum is very often a late finding. The author quotes from Ladd, who says that this condition occurs in healthy and well-nourished children under one year of age. It sometimes follows whooping cough and one case is reported caused by round worms.

In one series of 46 cases a large percentage gave a history of either marked constipation or diarrhoea. The author believes that operation should be the only treatment considered, and advises a right rectus incision thus exposing the ilioæcal junction. Reduction is successful in from eighty to ninety per cent of cases. Various authors are quoted; some suggest the suturing of the head of the cæcum to the pelvic peritoneum and ileum to the ascending colon. Others maintain that it is not necessary to take special means to prevent recurrence.

The recurrences are infrequent and are found mostly in those cases where the cæcum is not fixed at time of the previous operation. The mortality is very high in cases operated upon after seventy-two hours.

P. H. KREUSCHER.

Mayo, W. J.: Diverticulitis of the Large Intestine. *J. Am. M. Ass.*, 1917, lxxx, 181.

Portions of the large intestine have been resected for diverticulosis in 42 cases reported by the author. In 36 the sigmoid was involved, in one the transverse colon, in one the ascending colon, in one the hepatic flexure and cæcum, in one the rectosigmoid junction and in two the rectum. The diverticula were all of the acquired variety; that is, the mucous coat pouched through small openings in the musculature in contradistinction to true diverticula of the congenital, traction, or pulsion types in which all the intestinal coats cover the sac. The diverticula were multiple and occurred at any weak point in the circumference of the colonic wall, such as vessel holes or muscle defects. From one to eight inches of the intestine were seriously involved, although much longer stretches showed a diverticulosis tendency. Hardened masses of feces were often found in the distal extremity of the narrow-necked diverticula, although, as a rule, only one or two of the diverticula were directly responsible for the existing diverticulitis and peri-diverticulitis.

The symptoms closely resembled those of appendiceal inflammation, with the marked difference that in the great majority of instances the disorder was on the left side of the abdomen. It is altogether probable that most of the reported cases of so-called sigmoiditis are examples of diverticulitis. In many cases increased deposit of fat in the abdominal cavity undoubtedly had some influence on the development of the diverticula, especially if there had been a tendency to the formation of intestinal gases. The average duration of symptoms was two years; the longest was twelve years, the shortest seven days.

In 34 of the 42 patients a sensitive tumor was present in the left iliac fossa during the attack, which was attended by localized peritonitis and often by intestinal obstruction. In two patients diverticula were found in the rectum. Twenty patients had pain in the left iliac fossa. In 32 constipation was marked.

Clinically, cases of diverticulitis may be readily classified into four groups: (1) self-limiting diverticulitis and peri-diverticulitis; (2) diverticulitis and peri-diverticulitis with formation of abscess resulting in enterovesical, enterocutaneous and other fistule; (3) obstruction; (4) carcinoma developing on a diverticulum.

Of 42 patients with diverticulitis, with and without carcinoma, on whom resections were done, 14 per cent died within four weeks as the result of the operation. Although the mortality was high, it must be taken into consideration that these patients were usually adipose, and it was often necessary to operate during the stage of obstruction, infection, etc. A large majority of the fatalities occurred in the earlier period, when it was believed that the tumorfaction was due to carcinoma and extensive dissection seemed to be indicated.

It is of great value to be able to differentiate

between diverticulitis and carcinoma; in diverticulitis the removal of the mass of tissue, which would be essential in carcinoma, is not necessary. When a primary resection was made, an end-to-end union was employed, but as a rule it was found wise either to suture the anastomosed area well up into the peritoneum and leave the suture line exposed or to pass a folded strip of rubber tissue entirely around the anastomosis to suspend it in the wound, as there was a tendency to late infections. Unless provision was made for drainage, slowly progressing peritonitis occasionally caused death. To provide against gas pressure a good-sized rubber tube was sometimes passed by way of the rectum entirely through and well above the anastomosed area and fastened with a single suture to the anus.

EDWARD L. CORNELL.

Long, J. W.: Acute Appendicitis with Peritonitis; Cases that Should Not be Drained. *South. M. J.*, 1917, x, 565.

The author, in discussing this condition, calls attention to the fact that as soon as infection invades the appendix, the peritoneum immediately begins pouring out a straw-colored serous fluid, which is rich in antibodies and leucocytes, this fluid being sterile until the infection reaches the free peritoneal cavity.

He reasons, therefore, that this protective fluid is of real benefit to the patient in helping to overcome infection, and its removal takes away a strong protective barrier.

The author hesitates to lay down a fast rule as to when drainage may be omitted, but does not consider a gangrenous appendix *per se* a positive indication for drainage; he rather depends on the morale of the patient. In very questionable cases, he advocates drainage, and drainage always in thrombosis of the appendiceal vessels. A large quantity of fluid indicates omitting drainage, the character and odor of the effusion being the determining factors.

L. H. HILLS.

Abt, I. A.: Appendicitis in Infants. *Arch. Pediat.*, 1917, xxxiv, 641.

The author reviews 80 cases of appendicitis in infants under two years of age which he has collected from literature. There were 20 cases under three months of age, among which were 2 possible instances of prenatal appendicitis. In children from three to six months of age there were 6 recorded cases; 11 cases in children from six to twelve months; 40 cases in children from one to two years. Of this number 25 were males, 8 females and 7 were without record of sex.

Muscle spasm or rigidity of the right rectus muscle may be present early but is difficult to elicit. Nausea and vomiting are usually present a short time before the onset of the pain, though these symptoms tend to cease when the stomach is emptied by vomiting. They tend to re-appear when perforation occurs, when abscess forms, or

when intestinal paresis exists. Manifest chill is infrequently noted in the first stage of the disease. Temperature is unreliable. It may be high, or in some instances may be subnormal. Pulse usually corresponds to the temperature. Constipation is the rule among the more severe types; diarrhea occurs in the milder types, though both conditions may be present, one alternating with the other.

Heredity is an etiological factor and it is assumed that in such cases there is a peculiar inherent structural weakness of the lymphoid tissue of the appendix. Traumatism or diseases of the alimentary tract occasionally play a part in the production of appendicitis. It may also occur after erysipelas, scarlet fever, pulmonary and pleural infections, and tonsillitis. Foreign bodies, such as worms in the appendix, may bear a direct causal relation. The blood examination in almost every case shows a polymorphonuclear leucocytosis. Tenderness at McBurney's point, if it can be elicited, is of diagnostic importance. When there is palpable resistance on the right side, in the presence of other symptoms, the diagnosis of appendicitis should be suspected.

E. B. FREELICH.

Hartwell, J. A.: Carcinoma of the Splenic Flexure of the Colon. *Ann. Surg.*, Phila., 1917, lvi, 330.

After an extended study of the subject of carcinoma of the splenic flexure of the colon or its immediate proximity, Hartwell draws the following conclusions:

1. The splenic flexure is the third most common site for the growth of colonic cancer.
2. This growth tends to the production of obstruction with indeterminate premonitory symptoms.
3. This complication occurs acutely in nearly three-fourths of the cases coming to operation.
4. A recognition of the foregoing facts, and a more careful detailed study, with possibly an exploratory operation, should lead to an early diagnosis in a majority of the cases, and thus forestall acute complications.
5. The probable operative mortality of all cases up to the present time is over 60 per cent, and the percentage of the prolonged cures is exceedingly low,—10 to 25 per cent.
6. These appalling results are largely due to delayed diagnosis and improper mode of attack.
7. The latter should follow the principle of the two or more stage operation with provision for external colonic drainage, either preliminary or at the time of resection; always preliminary in the presence of serious obstruction or abscess formation.
8. The distal portion of the transverse colon, the flexure and the entire descending colon must be resected in order to obtain the requisite conditions for secure anastomosis with ultimate patency of the colonic lumen.
9. Notwithstanding the meager success thus far obtained, attention to the lessons learned from the successes and failures of those who have worked in

this field justifies the hope that this lesion may be as satisfactorily dealt with as cancer in other parts of the body.

G. W. HUGHES.

Swayne, W. C.: Rectal Diverticula as a Causative Factor in Pelvic Inflammation in Women. *British M. Jour.*, 1917, xxv, 91.

Diverticula occur most frequently in the sigmoid, descending colon, and peritoneal covered portion of the rectum. These diverticula are actual hernie in the wall of the intestine, at the points of attachment of the appendices epiploicae, with protrusion of the mucous membrane. They commonly contain faecal concretions; perforation is not an uncommon complication.

The author cites 2 personal cases, in one of which perforation had taken place leading into the bladder.

Operation aims at ligation of the pedicle of the diverticulum and invagination, but inasmuch as multiple diverticula usually exist, frequently imbedded in adhesions, and the disease occurs chiefly in elderly females, the operative risk is great. Medical treatment is of no avail. Diverticulitis should be considered as a possible factor in all pelvic inflammation of obscure origin.

LISTER TUHOLSKE.

LIVER, PANCREAS, AND SPLEEN

Bodenstab, W. H.: The Diagnosis of Gall-Bladder Disease. *J. Lancet*, 1917, xxxvii, 591.

Cancer of the gall-bladder or ducts, rupture of the gall-bladder, empyema of the gall-bladder, suppurative cholangitis, abscess of the liver, hepatitis, pancreatitis, etc., can be averted by an early diagnosis and operative treatment.

The diagnosis of gall-bladder disease rests almost entirely with the anamnesis. Many cases of cholecystitis or cholelithiasis are mistaken for diseases of the stomach, because of their reflex symptoms referable to the stomach, but bearing no food relation.

In a series of 452 cases, 311 had stones, and 141 cholecystitis without stones. Tenderness, the most constant symptom, was present in over 85 per cent of the cases with stones and 93 per cent of the cases without stones. Vomiting occurred in 80 per cent of the cases of cholelithiasis and 45.5 per cent of the cases of cholecystitis without stones. Belching was present in 70.5 per cent of cases with stones and 70.9 per cent of cases without stones. Dyspnoea during the attack occurred in 70.8 per cent of the former group and in 39.7 per cent of the latter group. The sensation of impending death is a very frequent sign. Radiating pain occurred in 71 per cent of cases with stones and 39.7 per cent of cases without stones. Reflex symptoms of digestive disturbance were present in 39 per cent of the first group and 41.8 per cent of the second group characterized by no definite food relation. Twenty-three per cent of the stone cases and 8 per cent of cases without stone gave a

history of jaundice. Many of the cases had bile in the urine the first twenty-four hours after an attack.

In the series stones were found in the proportion of 1 male to 9 females, while 31 males and 110 females had cholecystitis without stones. The gastric acidity varies from a hydrochloric deficiency to 100. Eighty-eight per cent of the first group and 94 per cent of second group had attacks both day and night.

The five cardinal symptoms of cholelithiasis are: radiating pains, vomiting, belching, dyspnoea and prostration.

The author's experience with the X-ray in diagnosis of gall-stones has not been encouraging. In 90 per cent of all cases of cholecystitis and cholelithiasis a correct diagnosis can be made from the history alone.

V. C. HUNT.

Seachner, A.: Anomalies of the Gall-Bladder and Bile Passages, with Report of a Double Gall-Bladder and a Floating Gall-Bladder. *Maryland M. J.*, 1917, ix, 211.

The author quotes cases demonstrating each of the following anomalies, having gathered his data from literature and from personal communications from a number of surgeons and hospital authorities: double gall-bladder, bilobed gall-bladder, diverticulum of gall-bladder; relating to location of gall-bladder: intrahepatic, left sided gall-bladder, transposition of viscera, floating gall-bladder; also absent gall-bladder, and hour-glass stomach.

Among the cases reported were those of a double gall-bladder and a floating gall-bladder; these came under the author's personal observation.

H. H. FREILICH.

Hendon, G. A.: Cholecystitis with and Without Gall-Stones, with a Classification of Symptoms. *South. M. J.*, 1917, x, 737.

The author's study is based upon 30 personal cases. Stones were present in 18 cases or 60 per cent. Nine cases were jaundiced at some period in the history of the complaint, and jaundice occurred in one case in which no stones were found. Stones were found in two cases where unsuspected, during operation for other conditions.

Typical colic occurred in 22 of the cases, or 73 per cent, and also in 5 cases where no stones were found. One patient upon whom a secondary cholecystostomy had been performed returned in six months because of periodic colic attacks. Complete relief followed a cholecystectomy, although 60 stones were removed at the first operation and none were found at the second.

Hendon reviews symptoms and shows that derangement of the stomach is the most constant, occurring in more than 83 per cent of his cases. He believes that one in every ten persons who think they have "stomach trouble" actually have a gastric disturbance, and that "indigestion" is a term used by the laity for expressing a variety of ailments

ranging from pregnancy to locomotor ataxia. He also states that the stomach is the seat of primary pathological changes less frequently than any other organ within the abdominal cavity. The only lesions occurring in it with sufficient frequency to be of practical importance are ulcers and their sequelae, and cancer.

In the 30 cases studied, typical colic ranks next to stomach derangement as a symptom, but its positive value is depreciated by the fact that there were 5 cases in which it existed and no stones were present, and 3 cases in which stones were present but unsuspected, the abdomen having been opened for other conditions. Gall-stone colic is often called "acute indigestion" by both patients and physicians. Seven illustrative cases of gall-stones are reported.

D. N. EISENDRATH.

Porter, M. F.: Cholecystectomy. *Ann. Surg.*, Phila., 1917, lxxvi, 321.

The result of study and experience in about 1,000 cases of surgical diseases of the gall-bladder and gall-ducts have led to the following conclusions:

1. The gall-bladder is an important organ but not vital.

2. Cholecystectomy increases bile pressure in ducts favoring danger from pancreatitis.

3. Symptoms of gall-bladder disease are only partially caused by tissues of the gall-bladder proper.

4. Recurrence of symptoms after cholecystotomy means overlooked stones, re-formed stones, infection of the bile stream, or hypercholesteremia.

The gall-bladder should never be removed save when necessary for the cure of the disease for which operation is done. It is generally agreed that gall-bladders of the following types should be removed: (1) hydrops with obliteration of cystic duct; (2) chronic empyema; (3) the cholesterol or strawberry gall-bladder; (4) calcareous or fibrous degeneration; (5) carcinoma, when limited to the gall-bladder; (6) extensive laceration or perforation. Many would add gangrene, yet the mortality is higher after cholecystectomy in such cases than after cholecystotomy and drainage.

It is the author's experience that the actually infected gall-bladder with edematous walls is practically always permanently cured by cholecystotomy; many patients operated upon twenty or more years ago are still living and well. The importance of bile flowing into the gall-bladder at time of operation or shortly thereafter is generally underestimated. Buchanan states that of 212 cases cholecystotomized, only 8.5 per cent were not entirely cured when bile flowed freely into the gall-bladder, while 45 per cent were not entirely cured when it did not.

The return of symptoms after cholecystotomy does not mean that cholecystectomy should have been done. It appears illogical to remove a gall-bladder in cases where the bile ducts are infected, yet permissible when interstitial cholecystitis

exists. "It seems warranted that it is neither necessary nor advisable to remove the gall-bladder except when it is diseased or injured beyond the probability of restitution."

F. P. HAMMOND.

Linder, W.: Diagnosis of Acute Pancreatitis, with a Special Study of Thirty-Three Cases. *J. Am. M. Ass.*, 1917, lxx, 718.

In presenting this report of 33 cases of acute pancreatitis, gathered almost entirely in the short period of three and a half years, it is the author's desire to arouse an interest in this condition and to show that the possibility of acute pancreatitis in every acute case demanding abdominal surgery frequently helps toward a diagnosis. Errors of diagnosis of this condition are mainly those of omission.

In the first series of 16 consecutive cases operated upon before June, 1915, there was a mortality of 62.5 per cent.

In the second series of 15 cases since June, 1915, the diagnosis having been made in 75 per cent of the cases, there was a mortality of 13.6 per cent.

The mortality statistics show the importance of prompt diagnosis and timeliness of operative procedures. Operation is indicated in all cases unless shock is extreme, and very rapid operation is of extreme importance. The condition of the patient will determine whether any gall-bladder operation otherwise indicated should be done.

The pancreas may be exposed by any one of four routes: (1) through the gastrohepatic omentum, which is preferable; (2) through the transverse mesocolon; (3) through the gastrocolic omentum, and (4) in the late stages through the lumbar region.

Operation consists of multiple punctures of the pancreas with blunt forceps and drainage of the gland with rubber tissue and gauze, as if it were an acute phlegmon. The omentum is closed around the tube.

The postoperative course consists of a strict anti-diabetic diet and sodium bicarbonate to reduce the pancreatic secretion. The patient should be kept under supervision for several years, owing to the possibility of recurrences of acute attacks and the development of cyst formations or chronic pancreatitis.

EDWARD L. CORNELL.

Morton, C. A.: Acute Pancreatitis, with Special Reference to Its Treatment and a Record of Three Cases Presenting Unusual Features. *Bristol M. Chir. J.*, 1917, xxxv, 80.

The diagnosis of acute pancreatitis is rarely made before operation. Upon opening the abdomen, areas of fat necrosis in the omentum direct the attention to the pancreas, which is usually swollen and hemorrhagic; blood-stained fluid is found in the lesser peritoneal sac. The disease may affect only a small portion of the pancreas. The vomiting in one of the author's cases was fecal, though this is extremely rare. Temporary recovery may occur with later exacerbation of all symptoms, terminating

fatally. In all 4 cases cited, there was a history of recurrent attacks of acute pain in the upper abdomen, simulating gall stones.

In acute pancreatitis, drainage should be established for the exudation into the lesser sac or into the retroperitoneal tissue around the pancreas. Suppuration of the pancreas is best drained from behind, a formidable operation. The drain should be to the left of the spine between the top of the left kidney and the spleen through incision below the last rib. Only the finger tips should be used for fear of injury to the splenic vessels. The drain should not be removed early. If possible, both anterior and posterior drainage should be established. Stones in the common duct may cause pancreatitis, but removal is rarely possible during acute pancreatitis because of the desperate condition of the patient.

LISTER TUBOISKE.

Sherman, H. M.: Splenectomy in Pernicious Anæmia. *Calif. St. J. Med.*, 1917, xv, 338.

The author reports this case chiefly because it illustrates the normal reaction of patients with pernicious anemia to a splenectomy, and it includes a necropsy report which is practically classic.

The patient was a man of fifty-one years; he had lost twelve or fifteen pounds in weight; blood showed 27 per cent hæmoglobin; blood count gave 850,000 red cells and 5,400 white cells at the first examination. Under dietetic and arsenic treatment he improved and returned to his home. About five months later he was transfused from his son, the hæmoglobin rising from 12 to 25 per cent, and later reaching 40 per cent. Two days after the first transfusion, a second, from another son, was made, the hæmoglobin rising to 53 per cent. The following day the spleen was removed; it was not enlarged and there were no adhesions. Two months later the hæmoglobin was 92 per cent. Death occurred thirteen months after the splenectomy.

The history of this case is reported in full. Brief abstracts from the experiences of different surgeons in similar cases are cited.

E. C. ROBITSEK.

Hill, R.: A Case of Acholuric Jaundice Treated by Splenectomy. *Br. M. J.*, 1917, ii, 424.

A stoker, aged 23, contracted dysentery in Gallipoli in August, 1915. He was affected with slight jaundice for some weeks during convalescence. A year later there was a sudden onset of pain in the right hypochondrium, a temperature of 104° F. and marked jaundice. The abdomen was tender but not rigid. The urine contained a small amount of bile pigment; stools were normal. Two days later there was hæmaturia. X-ray examination for calculi was negative.

Exploratory laparotomy was done on the fifth day, the hæmaturia, jaundice and fever persisting, and a distinct tumor evident across the left hypochondrium. The gall-bladder, kidneys and gastrointestinal tract appeared normal; the tumor proved to be the spleen much enlarged. A slight jaundice

persisted, but the patient's general condition improved following operation. On the eleventh day a fragility test showed partial hæmolysis with 0.5 per cent saline, and no hæmolysis with 0.575 per cent concentration. The serum was bile-stained. Blood count gave red cells, 3,000,000; white cells, 5,200; hæmoglobin, 45 per cent; color index, .75. Differential count gave polymorphonuclears 58.4 per cent; small mononuclears, 34.3 per cent; large mononuclears, 6.0 per cent; basophiles, 1.3 per cent.

There were three nucleated reds, some macrocytes and microcytes, poikilocytosis and some polychromatic staining. The Wassermann test was negative. There was no enteric agglutination, and no amebic organisms in the urine or the stools.

No improvement followed a month's treatment with iron, arsenic, cod liver oil, etc. Slight jaundice persisted. Splenectomy was done seven weeks after the onset; the spleen weighed 22 ounces. Microscopic section showed a general increase of fibrous tissue with atrophy of the malpighian corpuscles.

Convalescence was slow, but progressive. Four months after operation the blood picture was normal, except for an abnormal fragility of the red cells. The general health of the patient was good eleven months after operation, with no return of jaundice. As there was no family history of jaundice, the author considers this a case of acquired acholuric jaundice.

C. A. HEDBLUM.

MISCELLANEOUS

Ebright, G. E.: Differential Diagnosis of Abdominal Tuberculosis. *Calif. St. J. Med.*, 1917, xv, 306.

Tuberculosis of the abdominal viscera is commonly associated with pulmonary tuberculosis, but the primary infection is to be searched for in the lymphatic system, especially the peribronchial and retroperitoneal glands. The type in which tubercular peritonitis presents itself depends upon the rapidity of the inflammation, rapid processes being associated with a tendency to the formation of fluid and less tendency to the formation of adhesions, a slower process giving rise to thickening and adhesions with fluid in walled-off collections, and abscesses. The most chronic form gives rise to adhesions and hyperplastic growths in the walls of the intestines. Fever is usual in the acute and subacute forms, and may be absent in the chronic forms, or there may be subnormal temperature.

There is nothing characteristic in the symptomatology of tuberculosis of the liver or gall-bladder and diagnosis is practically never made except upon operation or postmortem. A helpful point in the diagnosis of tubercular appendicitis and hypertrophic tubercular changes in the ileum or cæcum lies in the fact that tuberculosis of the lung is also present. The local symptoms are no different from other forms of tumor or low grade inflammation.

Stierlin's sign is of importance in differentiating

hyperplastic tuberculoma of the cæcum from cancer. In the presence of the tubercular condition the X-ray shows that the bismuth mass goes more rapidly through the cæcum, resulting in a picture which gives no bismuth shadow in the cæcum, but only above and below it. If the question of diagnosis between hypertrophic tuberculoma of the ileum and of the cæcum arises, the cæcum empty of bismuth under the X-ray test would seem to indicate involvement of the cæcum; on the other hand, if bismuth shows in the cæcum it would indicate lesion in the ileum. Stierlin's sign is absent in cancer of the cæcum.

C. D. HATCH.

Coffey, R. C.: Intravisceral and Intra-Abdominal Pressure. *J. Am. M. Ass.*, 1917, lxi, 683.

The peripheral abdominal wall is a flexible structure, composed chiefly of flexible and elastic muscle enclosed in a flexible but non-elastic aponeurosis. While the wall is flexible to a large degree, it is collapsible only in its front portion. The collapsible portion, or anterior abdominal wall, contrary to the ordinary belief, is but slightly elastic under an ordinary acute strain, owing to the strong layers of aponeurosis surrounding the muscles. Except in chronic processes, such as the development of a tumor by cellular increase, a cyst, ascites, or pregnancy, there is but little change in the capacity of the abdomen of an otherwise normal person. Extreme distention of the abdomen may noticeably enlarge the abdominal cavity by pushing up the diaphragm at the expense of chest capacity. By elevation of the ribs, the girth of the upper portion of the abdomen may be increased, but the lower or middle part of the abdomen will be correspondingly diminished. Elevation of the ribs plus extreme distention of the abdomen makes tense and collapsible part of the abdominal wall and increases the girth of the abdomen at all points; but the only actual increase of abdominal capacity is made at the expense of chest capacity by elevation of the diaphragm. The abdominal cavity is air tight, but is by no means a vacuum.

There is always a variable and indefinite amount of pressure in the peritoneal cavity, known as intra-abdominal pressure. This pressure may be greater but is usually less than the atmospheric pressure.

The degree of intra-abdominal pressure depends on the variable contents of the abdominal cavity. The variable contents are: (a) extraperitoneal and mesenteric fat; (b) the visceral contents. The visceral contents are liquids and gases which may be intermittently expelled at any time, thus acting as an immediate safety valve for the establishment of an equilibrium and a normal intra-abdominal pressure. The extra-peritoneal and mesenteric fat is included within the inelastic abdominal wall and lessens the abdominal cavity in exact proportion to the amount of fat thus included.

The law of osmosis, by which fluids of different densities pass through an animal membrane and establish an equilibrium, has its counterpart in the relation of intra-abdominal and intravisceral pressure.

The author demonstrates by diagrams and X-ray pictures his results in applying the principles of intra-abdominal and intravisceral pressure. In some cases of ptosis he has placed the patients on forced feedings, thus increasing the intra-abdominal fat, with good results. The implanting of ureters, gall-ducts and the correction of incompetent ileo-cæcal valves by his method of operating has yielded normally functioning valves.

EDWARD L. CORNELL.

Roberts, C. W.: Subparietal Injuries of the Intestines and Kidney; Report of a Case. *J. Med. Ass. Ga.*, 1917, vii, 81.

Roberts makes the following summary:

When a patient has sustained an abdominal injury manifesting the usual symptoms of shock, nausea, vomiting, and rigidity of the abdominal wall, a diagnosis can safely be made of injury to the intra-abdominal contents which requires immediate attention. A gradually increasing resistant swelling over the kidney region requires undelayed surgical intervention. Operation upon injured viscera shall be performed within the first twelve hours after injury. The author strongly condemns watchful waiting, and believes that the surgeon can discriminate between mild cases which need no surgical interference and those that manifest injury to the deep-seated organs.

M. A. BERNSTEIN.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Blanchard, W.: Treated and Untreated Osteochondritis Juvenilis of the Hip. *J. Am. M. Ass.*, 1917, lxi, 1010.

The author reports several cases and shows roentgenograms in support of his theory that Perthes' disease is a unilateral trophic disturbance due probably to an impairment of circulation from the

median pelvic line to the foot. Diffuse atrophy of the bone, not only of the head and shaft of the femur but also of the corresponding side of the pelvis, was present in several cases. Since the disease has been differentiated from tuberculosis and shown to be comparatively mild, there has been a tendency to neglect treatment with the result that after one or two years movements are limited, especially abduction, the femoral head is almost destroyed and the neck distorted.

The course of the disease is about one year and during this time the hip should have the same mechanical and general treatment as that given to tubercular hips; otherwise the friction and concussion of weight-bearing will cause erosion of the head and coxa vara. After the first year the head of the femur usually begins to harden again and to resume its normal rounded form; and if the disease has had adequate mechanical treatment from the beginning, there is more nearly perfect regeneration and no loss in length of the leg. W. A. CLARK.

Thorning, W. B.: The Diagnosis of Acute Osteomyelitis. *Atlanta J. & Res. Med.*, 1917, XIV, 97.

Thorning cites the following case as more or less typical of an acute osteomyelitis, in which the diagnosis is not made as early as it should be. A five year old child had acute tonsillitis three weeks before, and had apparently recovered completely. A week before the author saw her, she fell out of a porch swing, spraining her ankle. The injury seemed trivial, as she resumed play shortly afterward. That night she awoke from sleep with severe pain in the ankle, liniment was applied. In the morning there was fever, the ankle was swollen and the pain more intense. A physician diagnosed the condition as a sprained ankle and advised hot applications. Thirty-two hours after the injury the rectal temperature was 104.5 F, pulse 150, the patient was delirious and apparently suffering great pain. The lower third of the leg was greatly swollen and reddened. A diagnosis of acute rheumatism was made, and salicylates were administered. On the third day the pain and temperature had subsided somewhat. On the fourth day, although more comfortable, the patient complained of severe pain just above the internal malleolus. This area was fluctuating, and on incising same, a large amount of pus was withdrawn. Two days later the X-ray showed necrosis of almost the entire shaft of the tibia.

Acute osteomyelitis is very frequently diagnosed as acute rheumatism; the latter diagnosis should be reserved for those cases where there is multiple arthritis, fever, sweats, and a tendency to endocarditis, etc. The white blood count in osteomyelitis is between 25,000 and 40,000; in rheumatism it is rarely so high. In osteomyelitis the lesion is either above or below the joint, whereas in rheumatism the joint itself is affected. The pain in osteomyelitis is abrupt and very severe; in rheumatism the onset of the pain is gradual and usually less severe. The capsule of a rheumatic joint on palpation is tense and very often fluctuating, and the point of greatest tenderness is directly over the joint line. In osteomyelitis the pain is not directly over a joint, but to the side of it.

The pus of an osteomyelitis may perforate into a joint and produce a septic arthritis, but this never occurs on the first, second or third day. Manipulation of a rheumatic joint greatly increases the pain,

and immobilization usually gives relief. With osteomyelitis movement or immobilization makes no material difference. In differentiating from a Neisserian infection of the joint, the previous history is of great value.

As to the etiology, the author believes that osteomyelitis is always an infection, the most commonly found organism being the staphylococcus pyogenus aureus. Mixed infections are quite common. If the theory is accepted that osteomyelitis is always hematogenous, a primary focus must be sought somewhere else in the body. Most cases give a previous history of tonsillitis, influenza, ingrowing toe nail, etc. The treatment consists of immediate incision through the periosteum. The bone is then drilled through the cortex down to the marrow cavity, and free drainage instituted.

J. J. KURLANDER.

Kreuscher, P. H.: Semilunar Cartilage; Fracture-Dislocation and Fragmentation. *Surg. Clin Chicago*, 1917, I, 787.

The author discusses the treatment of fracture-dislocation and fragmentation of the internal semilunar cartilage. He states that one of the most frequent lesions in or about the knee-joint, which may not be recognized when the patient is first examined, is semilunar cartilage disease. There may be present a simple dislocation of part or all the cartilage or there may be fracture-dislocation or fragmentation.

Etiologically several types are recognized: (1) fracture or dislocation due to direct external trauma; (2) malposition or fragmentation of the cartilage, due to internal trauma, i.e., very quick twisting or flexion of the knee-joint under weight; (3) loosening and fraying of the cartilage due to chronic synovitis or osteo-arthritis.

Kreuscher quotes various authors who give the relative proportion of injuries to internal and external cartilages as follows: Morrison, 50 internal to 1 external; Walton, 81 internal to 4 external; Martin, 92 internal to 8 external.

When a patient presents himself, giving a history of an external trauma or a twisting of the knee-joint which is followed by considerable pain and swelling, one must at once think of a cartilage injury. If in addition there is a history of locking of the knee-joint and the typical acute pain accompanying it, followed by the disappearance of this condition after manipulation or rest, then it is quite possible that it is a case of fragmented or loosened cartilage. When the locking recurs repeatedly, or when a small body can be felt under the skin internal to the patella, which is not freely movable, then a diagnosis of internal semilunar cartilage injury is justifiable.

The treatment is surgical and should be carried out as early as possible. The author holds with Murphy that the best time for operation is from seven to ten days after the original dislocation or repeated attack of the same trouble.

The operative technique is as follows:

"The patient is placed upon the operating table flat on his back, with his knees flexed over the end of the table and the head and body lowered, essentially a Trendelenburg position. The knees are flexed at right angles to the thighs, as this gives the very best possible position for opening the knee-joint at the semilunar cartilage location. An incision about $2\frac{1}{2}$ inches long is made parallel to and either internal or external to the ligamentum patellæ, as the case may be. After the incision has been extended downward to the upper end of the tibia it is curved outward and almost parallel with the articulating surface of the tibia for a distance of about $1\frac{1}{4}$ inches. This gives almost a right-angled incision, and after cutting through the skin and fatty tissue exposes the true capsule of the joint. A fresh scalpel is used in making the incision through the capsule about on the same lines as the skin incision. This brings one down to the synovial capsule, which is opened with great care, and for the first time the joint cavity is opened. Before beginning the operation it is necessary that a very firm tourniquet, in the form of a large rubber tube or an oversized band, such as is used on the blood-pressure apparatus, be applied high upon the thigh. This prevents all bleeding from the skin and subcutaneous tissue, so that the field is practically bloodless, and it rarely becomes necessary to introduce a sponge into the wound or into the joint. When the synovial capsule is opened the joint fluid often escapes very freely if the injury has been a recent one. If it is clear synovial fluid the loose or fragmented cartilage may be clearly seen in the field and grasped with a forceps and drawn outward. In the ordinary case a curved scissors frees that portion of the semilunar cartilage which still remains attached with very little difficulty. If any difficulty is encountered at all, an adduction of the leg on the thigh, in the case of an internal semilunar cartilage operation, gives one free access to the posterior portion of the semilunar cartilage attachment. Great care is exercised not to injure the surface of the joint in any way. After the cartilage is removed the edges of the synovial membrane are approximated and sutured with fine catgut. The capsule is closed with catgut and the skin sutured with horsehair and the operation is completed."

After-treatment consists in placing the leg in a straight wire cage and applying a Buck's extension with a weight of from 12 to 15 pounds, so as to keep the joint surfaces separated during the process of repair. After twelve to fifteen days active motion is permitted, and at the end of three or three and one-half weeks the patient is able to be about on crutches.

The operation for the removal of the semilunar cartilage in uncomplicated cases is very successful. The absence of the cartilage in the knee-joint does not interfere with the function of the joint.

PHILIP LEWIN.

Bucholz, C. H.: The Stiff and Lame Shoulder.
J. Am. Med. Ass., 1917, lxi, 968.

The complicated structure of the shoulder joint explains the great variety of affections which give rise to lameness. The author describes several of these and briefly outlines his methods of treatment.

Subacromial bursitis, if acute, requires rest with the arm supported in abduction. Hot bakings and massage are useful after the acute symptoms have subsided. If the condition has become chronic and adhesions are present, forcible manipulation under anæsthetic, or even opening of the bursa may be necessary, but as a rule careful exercise will give relief. The muscular retraction, usually of the inward rotator muscles, which follows trauma is best treated by frequent and gentle stretching manipulations rather than attempted mobilization by quick stretching. Infectious arthritis is treated in a manner similar to that for the acute condition described, after eliminating the etiological factors. In cases of disability due to hypertrophic osteoarthritis very conservative methods should be followed and all irritative measures avoided. Baking for short periods and light massage with gentle resistive movements is the author's plan of treatment. Rupture of the supraspinatus tendon is an infrequent trauma. Three such cases which required suture of the lacerated tendon are reported. Non-adherent subacromial bursitis is mentioned as a distinct group, but there is some doubt about the existence of such a chronic condition without adhesions.

The conservative treatment as employed by the author consists in baking for fifteen minutes, gentle massage of shoulder and upper arm muscles followed by light passive exercises, chiefly of rotation, with the patient lying on his back, the operator moving the arm with one hand and directing the movements with the other hand upon the acromion and humeral tuberosity. Abduction and combined movements are gradually introduced and the range of movements amplified.

W. A. CLARK.

Petrilli, G. L.: Gunshot Wounds of the Knee
(Contributo clinico sulle ferite di guerra del ginocchio). *Policlin.*, Roma, 1917, xxiv, sez. chir., 401.

In the author's experience wounds of the knee formed about 2.88 per cent of the total number of wounded. About 52.40 per cent of the knee wounds were penetrative knee-joint injuries and 47.6 per cent non-penetrating. Altogether 126 knee wounds were treated in about one year. Of these 62 progressed aseptically. Of 16 cases resulting in death, 8 had multiple lesions, cranial, thoracic, etc.

The fundamentals of the treatment adopted were (1) asepsis and immobilization in wounds that were apparently non-infected or only very slightly infected; (2) immediate operation of septic wounds; (3) in cases of arthritis, with unimportant osseous lesions, if the patient was in good condition, toilet of the area with lateral arthrotomy, closure of the

synovial, interrupted irrigation, and abolition of transarticular drainage. (4) in severe infected osseous lesions, wide opening up of the tract and section of the lateral ligaments, and according to the case simple immobilization in flexion, leaving the joint largely exposed, or resections more or less extensive of the articular head. W. A. BRENNAN.

FRACTURES AND DISLOCATIONS

Page, C. M., and LeMesurier, A. B.: Early Treatment of Gunshot Fractures of the Thigh. *Brit. J. Surg.*, 1917, v, 66.

The authors state that opinion as to surgical treatment of compound fractures is by no means unanimous. The question arises whether better results can be obtained from extension or by treatment with the double inclined plane. The Thomas knee splint or one of its modifications is the best arrangement available. The conclusions are based upon observation of 108 cases, not including gross injuries to the knee or hip joints. Of 125 cases observed over an average period of 51.4 days, ten were not infected and 71 were severely infected. There were four amputations and ten deaths.

Satisfactory drainage should be permanently established as soon as possible after the injury. All loose fragments of bone should be removed and the lacerated skin dissected away. Afterward dry sterilized gauze may be employed in preference to tube drainage, but in some cases both are necessary.

Further incision and drainage may be necessary in cases of spreading cellulitis or when infection by the bacillus aerogenes capsulatus occurs. There are three periods during which immobilization by splints is indicated: (1) the period of early transport; (2) the period of acute infection; (3) the period of healing.

The Thomas knee splint is applicable in fractures of the lower two-thirds and the Hodge's splint in the upper third of the femur. Proper action of the Thomas splint depends upon the close fit of the ring, the average size of which should be an internal circumference of 24½ inches. This splint may be used in its original shape or may be flexed at the knee to give the double inclined plane action. The modifications possess no advantages over the original pattern. For both varieties Buck's extension is commonly used; however, extension can be made by transfexion pins through the lower end of the bone in those cases where full control of the lower fragment of the femur is required. Ankle-extension attachments of molded plaster of Paris or of leather have not proved a success.

During the after-treatment the splint should be suspended from a beam; this allows more freedom to the patient and facilitates nursing and dressing. Pressure sores and foot drop should not occur if the patient is properly cared for.

In clean cases the fractured bones are brought into their proper position during the first week of treatment; in severely infected cases it is sufficient

to let the limb rest comfortably without making a forcible effort during the first two weeks to pull it out to full length. In 51 cases of fracture of the lower third of the femur, flexion of the lower fragment was observed in 47. If manipulation is necessary to reduce the deformity, antitetanic serum is given two days before such a procedure is attempted. The great sciatic nerve was injured in 6 cases, the external popliteal in 4 cases, and the anterior crural in 1 case; secondary paralysis of the external popliteal occurred in 7 cases. Injuries to large arteries were found in but 3 cases of the series.

The authors report thirty cases of persistent high temperature due to bone infection. Five cases developed tetanus.

In some cases it is possible for the patient to be up and about in some form of ambulatory apparatus which immobilizes the fragments.

P. H. KREUSCHER.

Thomas, H. B.: Early Recognition, Treatment, and Prognosis of Congenital Dislocation of the Hip. *Interst. M. J.*, 1917, xxiv, 728.

The author draws attention to the necessity of early diagnosis, and the recognition by parents of the serious nature of ailing conditions of the femoral head, neck and acetabulum, each having as much importance in the prognosis as treatment. Cases should be recognized in children under four years, as each later year lessens the value of the treatment. He believes that all children who walk late should be examined, especially those who limp.

Orthopedic treatment is classified as follows: (1) manual replacement; (2) mechanical replacement; (3) open operation. The author believes manual replacement preferable and advises open operation only as a last resort in unilateral cases.

H. W. MEYERDING.

SURGERY OF THE BONES, JOINTS, ETC.

McKenna, H.: Surgery of Bones and Joints, with Especial Reference to the Open Operative Treatment of Fractures, and a Method of Arthroplasty in Ankylosis of the Elbow-Joint. *J. Am. M. Ass.*, 1917, lxi, 801.

The author refers to the fact that most organisms require special culture media for their growth, and also that there are certain points of election which these organisms choose for localization. The synovial structure of the joints is very frequently involved, and often to such an extent that an ankylosis occurs. He points out that in certain types of joint infection, especially the gonococcus, an arthroplasty may be done early before contractures occur.

Special stress is laid on careful interpretation of the history, and the author calls attention to the paragraphs on incubation and diagnosis in a paper by Kreuscher in which a careful study was made of 1,000 cases of arthritis. The open and

closed methods for the treatment of fractures are considered. Careful asepsis and sterilization of instruments and sponges is advised. A very successful operation for ankylosis of the elbow performed after the plan of Murphy is described.

A transplantation of bone by the autogenous graft is highly recommended in ununited fractures, especially to fill up certain bone defects caused by disease or a congenital absence of bone.

P. H. KREUSCHER.

Salinari, S.: The Study and Treatment of Gunshot Wounds of the Limbs (Contributo allo studio ed alla cura delle ferite d'arma da fuoco degli arti). *Riforma med.*, 1917, xxxiii, 654.

The author's report is based on 15,000 wounded soldiers observed in the Italian army, of which 10,950, or 73 per cent, were limb injuries. Of the latter, 5,130, or 34.2 per cent were of the upper extremities and 5,820, or 38.8 per cent were of the lower extremities.

About 70 per cent of the total number involved the soft parts only; 21 per cent were skeletal injuries, and 4 per cent were articular; 1.1 per cent involved the blood vessels; and 3 per cent the nerves; 33.7 per cent were rifle wounds; 52.6 per cent were large projectile wounds. Statistics as regards the region of the upper or lower limb in which the lesion occurred are also given.

The author discusses the various methods of treatment in vogue. He draws attention to the desirability of treating limb wounds throughout their course in the same hospital service under the survey of the same staff. Such hospitals should be completely equipped both for sanguinary and bloodless methods, the latter being especially important in the after-care of fractured limbs to avoid the complications and malfunctioning of limbs, which are only too commonly observed through the lack of efficient treatment. He deplores the fact that after two years of war the therapeutical aids at the disposal of surgeons for the correction of deformities and anatomical defects are absolutely insufficient in Italy, and that the maimed are sent from hospital to hospital until finally they are left to their own devices. There is a vital necessity for special hospitals for the complementary treatment of limb injuries.

W. A. BRENNAN.

Ryerson, E. W.: Interesting Cases of Bone Surgery. *Int. J. Surg.*, 1917, xxx, 285.

In discussing an ununited fracture of the neck of the femur in a woman of 40, the author states that in many cases the abduction treatment, i.e., lateral traction, is the proper procedure.

"The abduction of fractures, putting them up in the abducted position after they have been pulled down, is the usual procedure, although it has its drawbacks, and for such cases as cannot be treated in either of these two ways, or have not improved after such treatment, unquestionably the best meth-

od is the bone peg as described by Albee. There is no doubt that this bone peg should be autogenous, especially in older people."

The author has used wire nails in some old cases with success. Nail cases in the aged, however, will not do so well, and very few of the old ununited cases can be treated by nails; the autogenous bone peg should then be used.

Recently the use of boiled beef bone for pegs, for screws, and for nails, has aroused interest, and later work may conclusively demonstrate its value. Gallie, of Toronto, has performed the Albee spine operation in a number of experimental cases, employing boiled beef grafts instead of the tibia.

Ryerson emphasizes the point that the graft should not be placed in the greater trochanter, but below it, so as to slant upward. PHILIP LEWIN.

Federici, N.: Right Gonarthrotomy for Purulent Fibrinous Synovitis in a Woman 72 Years of Age; Recovery. (Gon-artrotonomia destra in vecchietta di 72 anni per sinovite fibrino purulenta; guarigione). *Gazz. d. osp.*, Milano, 1917, xxxviii, 571.

A woman of 72 had for four months suffered from severe inflammation with slow synovial involvement in the right knee. There was but little exudate and the synovitis was evidently deep-seated with involvement of the peri-articular structures.

The author made a total cuneiform resection of the knee. Intervention was limited to the synovial, emptying purulent fluid from all anfractuositities and making a careful toilet of the wound. The patient made an uneventful recovery in spite of her advanced years. The Textor technique was followed in the gonarthrotomy. W. A. BRENNAN.

Cotton, F. J.: Some Further Data on Artificial Impaction of the Hip. *Ann. Surg.*, Phila., 1917, lvi, 380.

Cotton believes that probably one-half of all cases of fracture of the hip treated at the large general hospitals show good functional results, whether the type of fracture is extra- or intra-capsular. As to the extra-capsular type, non-union is a negligible factor; the question is only that of fixation so as to insure reasonably accurate reposition of the fragments and the avoidance of adduction contracture, which is important not only in the treatment of hip fracture, but in all lesions of the hip joint. Adduction contracture is probably the chief factor in the disability of most hip fractures.

Cotton has used the following methods: (1) the method of Phillips, Maxwell and Ruth, which consists of traction in abduction combined with lateral traction; (2) Whitman's method, fixation in abduction after manipulation; (3) Moore's method of abduction in flexion in the so-called "frog spica."

One case treated by the first method was very satisfactory. The second and third methods were

used repeatedly. Whitman's method has given poor reduction with overlapping of the fragments in two cases; in the other cases results were good.

Moore's method has the advantage that these patients may sit up immediately. It has the disadvantage of involving flexion of the knee, a considerable source of trouble later in limbering the knees following use of the splint. All these cases eventually do well.

For extra-capsular fractures the treatment should be abduction in flexion. The method requires an efficiency in after-care which is not always secured in a busy general hospital. Regarding the treatment of the intra-capsular type of fracture, there are two essentials, the prevention of adductor spasm and the minimizing of eversion. This does not necessarily mean the breaking up of the impaction by a forcible correction, but may be carried out by gradual correction to the best position obtainable through the use of sand bags without disturbing the impaction. There is always marked absorption of the femoral neck in varying degree. This does not occur in extracapsular fractures. Absorption is very rapid. In every case of intra-capsular fracture whether impacted or not, careful X-rays at intervals show an absorption with porosis of the bone and there is also shortening of the neck and often a bending of the neck into coxa vara. If the bone-forming power is poor and the softened bone fails to hold the impaction, it simply falls apart. Many cases of impacted fracture have been found loosened because of non-union a year later. Most of these cases were sent out on crutches after four weeks, although Cotton reports two cases where there was no union in spite of careful treatment.

Cotton allows weight to be borne after two months in the extra-capsular type of fracture. The intra-capsular fractures are treated in plaster for three months, no weight borne for four months, and full weight after six months. Even then he anticipates some failures. The production of artificial impaction concerns itself with the intra-capsular or sub-capital fracture, the fracture of the neck proper, in which there is no impaction present or in which the deformity, especially the eversion, is extreme. The operation results in good apposition, and the position is often perfect. The produced impaction gives the patient a more fortunate form of hip fracture. These cases are treated exactly the same as accidental impacted fractures, with no better prognosis, except that position is better and impaction more firm. Cotton reports some cases and states that from the results obtained, much is still to be desired. He re-emphasizes the possibility that a firm impaction may break up spontaneously several months afterward, due to the absorption of bone.

J. J. KURLANDER.

Serafini, G.: Transplants of Strips of Striated Muscle (Su trapianto di lembi di tessuto muscolare striato). *Sperimentale*, Firenze, 1912, lxxi, 223.

The author reviews the findings of previous investigators on muscle transplantations down to Lexer, in

1914, who reported that free muscle transplants degenerated rapidly and were converted into connective tissue. The author has made experiments on dogs, guinea pigs and rabbits. Five experiments with pedunculated strips leads him to think that plastics with total or partial pedunculated strips ought not be employed except when they are autogenous as regards vascularization and innervation. In 9 experiments with free muscle strips whether or not fixed by sutures he found degeneration, necrosis of the muscle substance, and a progressive substitution of the transplant by connective tissue.

From other experiments made it seems clearly demonstrated that only those muscle transplants endowed with their own nerves and vessels are positive. Of all techniques tried by the author this method alone gave a favorable result.

In practice the author is of the opinion that free muscle transplants ought not be used, but rather fascia lata which is easily sutured, is resistant, and has great vitality. But partial or total pedunculated strips autogenous as regards vascularization and innervation can logically be utilized even from the functional viewpoint.

W. A. BRENNAN.

Chaput, H.: High Amputation of the Shoulder (Les amputations hautes de l'épaule: amputations sous-acromiale, intra-acromiale et intra-coracoïdienne). *Bull. et mém. Soc. d'chir. de Par.*, 1917, xlvi, 1707.

In the case of a soldier who received a gunshot injury of the upper humeral extremity and the external part of the clavicle Chaput performed a subacromial amputation, in order to avoid an interscapulothoracic disarticulation. Classically there is no intermediate operation between disarticulation with flap or racket and interscapulothoracic resection. Chaput considers it inadvisable to make interscapulothoracic amputation when there is not enough tissue for a good disarticulation of the shoulder, as in the case reported. It is preferable to make a high shoulder amputation. Three different methods can be employed: (1) subacromial; (2) intracromial; or (3) intracoracoid amputation.

In the subacromial amputation Chaput resects the soft parts circularly below the acromion and in the thoraco-brachial angle. In the intracromial the section is in the thickness of the acromion and the clavicle with circular incision of the soft parts. In the intracoracoid amputation the scapula immediately is sectioned inside the coracoid and glenoid. The soft parts are incised either circularly through the great pectoral muscle or by shaping a flap in the form of an epaulette if the teguments are in good condition. The case operated upon by Chaput gave excellent results.

W. A. BRENNAN.

Thompson, J. E.: Anatomical Routes for Operations on the Long Bones of the Upper Extremity. *Texas St. J. Med.*, 1917, xiii, 170.

It is quite essential in the performance of surgical operations that the operator have, first, sound

anatomical knowledge; second, equally sound knowledge of surgical pathology; third, technical skill; and fourth, well-balanced judgment.

In the exposure of long bones it is necessary to have a mental vision of certain fixed anatomical structures. One must bear in mind the position of the axillary, radial, median and ulnar nerves, and also the lines of the great vessels. Muscles must not be unnecessarily mangled. A deep wound should be avoided where a shallow one will suffice. Sensory as well as motor nerves should be preserved. In the exposure of the lower third of the shaft of the radius, the common extensor tendons, the extensor carpi radialis brevis, and the extensor brevis pollicis should be born in mind.

In an exposure of the lateral aspect, an incision along the posterior border of the brachioradialis can well be used. The middle and upper thirds of the radius can be exposed by keeping in mind the situation of the supinator brevis. When operating upon the ulna near the elbow it is often necessary to dissect the ulnar nerve out of its sheath.

In the exposure of the humerus the insertion of the deltoid forms one of the important landmarks. In the middle third of the shaft, the musculospiral nerve must be divided. An incision along the anterior margin of the deltoid gives the best exposure of the upper articulating end of the humerus.

P. H. KREUSCHER.

ORTHOPEDICS IN GENERAL

Zadek, I., and Barnett, E. L.: The Importance of the Ligaments of the Ankle in Correction of Congenital Clubfoot. *J. Am. M. Ass.*, 1917, lxi, 1057.

In order to free the posterior end of the os calcis so that complete correction of equinus can be obtained, the authors cut the posterior ligaments of the ankle joint with a tenotomy knife inserted in front of the Achilles tendon, vessels and nerves, and directed forward. The foot is then pushed up in dorsal flexion, and instead of the rounded sole with bending at the mediotarsal joint which occurs in most cases where tenotomy of the Achilles is done, the foot comes up in complete dorsal flexion all in one plane. This precludes the possibility of the relapsed club foot, which is the result of mere bending at the middle instead of complete correction of equinus.

W. A. CLARK.

Lewin, P.: Congenital Absence or Defects of Bones of the Extremities. *Am. J. Roentgenol.*, 1917, iv, 431.

The author deals with the nomenclature, prevailing etiological theories, and treatment of congenital anomalies of the bones of the extremities. He submits an exhaustive bibliography and a detailed description with radiographs of fourteen cases.

Lewin believes that no one theory explains all the conditions found. The amputation theory, the ray theory, heredity, each seems to account

for some cases. The condition does not alter the prognosis as to life, but the development of missing bones probably never occurs. The possibilities as to correction of deformities are generally favorable. After the part has been retained in position until the child is old enough for operation, permanent results can be obtained by transplantation of tendons and bones.

R. B. COFIELD.

Hibbs, R. A.: Treatment of Deformities of the Spine Caused by Poliomyelitis; a Report of Eight Cases in Which Fusion Operations Were Performed. *J. Am. M. Ass.*, 1917, lxi, 787.

Plaster jackets and braces only retard the development of deformity. No case is operated upon until long after the acute attack has subsided, and obviously no case is operated upon if there is any prospect of recovery of the affected muscles. The technique of operation is identical with the fusion operation performed on patients with Pott's disease. Hibbs' technique is as follows:

An incision is made directly over the tips of the spinous processes, down to the bone. The periosteum over each tip and ligament between is then split and the periosteum elevated from each tip and separated from each vertebra until each spinous process and lamina is completely bare to the base of the transverse process. The periosteum is more adherent in adults. The lateral articulations which lie at the base of the transverse process are then curetted. A small piece of bone is elevated from the lamina and turned down, its free end resting on the one just below it. The spinous processes are next partially divided and broken down so that the tip of one comes in contact with the base next below it. The periosteum and ligament are then brought together and fastened with interrupted sutures of ten day chromic catgut. The skin is also closed with the chromic gut.

Dressings and a brace or jacket are then applied. The patient is kept in bed for eight weeks, and wears the brace for one year. Curetting the lateral articulation insures a fusion here. Turning down a piece of bone from the lamina prevents any tissue from falling between the laminae and insures their fusion. Hibbs prefers a steel brace which has been fitted a week before the operation. In six cases, there was conspicuous deformity and in three such weakness that the patients could not even sit up unaided. All now have much better posture, much more stability, and protection from a progressive increase of deformity; they probably have been saved from the necessity of wearing a brace or jacket indefinitely. There is no disadvantage in fusing low down, and possibly in some instances a longer fusion is better.

J. J. KURLANDER.

Elbright, E. D.: Orthopedic Treatment of Acute and Convalescent Poliomyelitis. *J. Am. M. Ass.*, 1917, lxi, 694.

Operations designed to correct deformity are not sufficient. Deformities must be prevented, and

more important than this, permanent paralysis must be prevented. The division of the disease into the acute, convalescent and chronic stages is not sufficiently accurate and does not correctly correspond with the pathology or the clinical course.

Absolute rest is essentially the treatment of the acute stage. Complete immobilization of the entire body by the use of a plaster bed gives very favorable results. Of the most important muscles, the deltoids show the most marked improvement and the quadriceps the least improvement. All the muscles of the shoulder recover in about the same degree as the deltoids, except that the external rotators, supraspinatus, infraspinatus and teres minor appear slower to recover. Of 46 paralyzed shoulders, all but 2 show a marked improvement and Ebricht believes that eventually these will be use fuljoints. Ebricht summarizes treatment as follows: Absolute motor cell rest, in the acute stage. In the subacute stage, rest and support of the paralyzed muscles.

The author notes that:

1. The most frequent regions of paralysis in order named are: anterior foot muscles, quadriceps, glutei, hamstrings, deltoids, hip flexors, internal rotators of the thigh, and external rotators of the shoulder.

2. Treatment of spastic cases is very unsatisfactory.

3. A stretched muscle will not regain its tone. This is the basis of all treatment, and every weakened muscle should be treated with this in mind. The results in the treatment of deltoids were obtained by keeping the muscle relaxed by the use of a brace which elevates, abducts, and externally

rotates the arm. Whether the elbow is flexed or extended depends upon the condition of the biceps or triceps.

4. Many cases have been proved to be cases of muscle fatigue, not true paralysis. Overcorrection in plaster for several weeks gives very good results, particularly in dealing with the leg muscles.

5. Many spines are injured because children are allowed to walk too early. Braces should not be used until they can be used without injury to other weakened muscles.

6. The treatment can be carried out more successfully in the hospital than in the home because of the constant supervision.

7. Electricity has no place in the treatment of this disease.

8. Muscle training and re-education is very valuable in the convalescent and chronic stages, but is contra-indicated in the acute and sub-acute stages, where its use may do much harm by stimulating the diseased motor cells that require absolute rest.

9. Out of 112 cases, 86 showed a very weakened condition of the spinal muscles, and 42 presented a decided curve. The author believes that poliomyelitis is the cause of most cases of scoliosis. He doubts whether faulty posture alone causes scoliosis, with the exception of those cases caused by rickets, empyema, asymmetry, etc.

All treatment of weakened or paralyzed muscles should be based on the law that a stretched muscle will not regain its tone, and all affected muscles should be held in a position of constant relaxation.

J. J. KURLANDER.

SURGERY OF THE SPINAL COLUMN AND CORD

Blair, R. B.: A Note on Cervical Laminectomies. *Lancet, Lond.*, 1917, cxviii, 200.

The number of cases of gunshot and shell wounds involving the spine which are operated on at the clearing station is small. Many are hopeless; however, there are cases in which operation should be considered. The deciding factors may be incomplete paralysis, accessibility of the missile, and pain due to pressure on nerve-roots, any one of which or a combination of all three should remove all doubt from the surgeon's mind as to operation.

If there is pressure on the cord by bony fragments or missiles the sooner that pressure is removed the more hopeful is the outlook. Should a missile be lodged delay may invite the advent of sepsis.

Before considering operation an X-ray examination is advisable.

Retention of urine necessitates catheterization every six hours or suprapubic cystotomy, usually the latter seems wise. Thompson Walker advises such a procedure as early as possible. V. C. HUNT.

Guillain, G., and Barré, I. A.: Gunshot Injuries of the Spinal Cord (Les plaies de la moëlle épinière par blessures de guerre). *Bull. et mém. Soc. méd. d'hôp. de Par.*, 1917, xli, 896.

During the French offensive at the Somme from July 1 to December 1, 1916, the authors observed 225 cases of true or supposed spinal cord injuries and traumatic paraplegia in their service. Of these, 138 cases died in the hospital and 87 have been evacuated. In a previous report the authors stated that cord injuries are most frequently due to fragments of shell; 125 of these cases were due to this cause, 51 were bullet injuries, 23 shrapnel, and 28 miscellaneous. The dorsal region is most frequently injured. In the 138 fatal cases, 12 were cervical, 43 were superior dorsal, 51 inferior dorsal, and 32 were lumbar injuries.

At autopsy in 24 cases the lesions found were hæmatomyelitic with acute necrosis of the cord without any existing opening of the dura mater. It must not be assumed that there is total or partial

section of the cord in cases of traumatic paraplegia. There are cases where the projectile, whether or not it fractures a vertebra, passes at some distance from the cord without injuring the dura in any way, but nevertheless indirectly causes intramedullary lesions with hæmatomyelia or necrosis which give rise to a clinical paraplegia syndrome.

In only 15 autopsies did the author find complete anatomic section of the cord. This condition can only be verified at autopsy, because during an operation it is almost impossible to affirm that a cord is completely sectioned.

Among 87 cases which recovered and returned to base hospitals were 35 cauda equina lesions.

Among the dorsal and lumbar medullary lesions there were 9 cases which showed a Brown-Sequard syndrome. All survived and were evacuated. Cauda equina lesions were relatively numerous and showed a tendency to progressive improvement.

W. A. BRENNAN.

Roberts, C. W.: Gunshot Injuries of the Spinal Cord, with Report of Two Cases. *South. M. J.*, 1917, X, 734.

In civil practice injuries of the spinal cord produced by gunshot wounds are frequently seen, and

the symptoms which follow furnish the key to treatment. Some surgeons advise and practice exposure of the cord over the seat of injury in all cases, holding that the real extent of injury to the cord can only be determined by exploration and that no harm is done by this procedure. A more conservative view favors waiting in such cases to determine whether or not the cord is completely divided. Regeneration of nerve tissue in the cord after complete division is a mooted question. The present teaching and accepted practice favors operative procedure in all cases where clinical signs or the X-ray give evidences of pressure on the cord. In gunshot injuries fragments of vertebrae are frequently driven against or into the cord, and in many cases the bullet itself is buried within the cord substance. When there is sudden and complete paralysis of motor and sensory nerves below the segment of cord involved in the injury, the author advocates the expectant plan of treatment, but if gradual paralysis follows the injury, or if paralysis is confined to nerves of motion, operative delay is disastrous in most cases. He gives reports of two cases, one in each class, to prove the correctness of the procedure as he has outlined it.

D. N. EISENDRATH.

SURGERY OF THE NERVOUS SYSTEM

Sommerfelt, L.: Metastatic Spinal Ganglion Sarcoma with Induced Ascending Paralysis (Sarkom utgaende fra spinalganglion med infiltration i rygmargens og hjernens tynde hinder, under bildest av en opadstigende lammelse). *Norsk. Mag. f. Lægevidensk.*, Kristiana, 1917, lxxviii, 968.

The case of spinal ganglion sarcoma with induced ascending paralysis which is reported by Sommerfelt is unique in literature, according to his research. It occurred in a man of 28 years, and the symptoms were those of paralysis. Death resulted and autopsy disclosed a sarcoma lying entirely outside of the spinal canal and situated about the twenty-fourth left spinal ganglion. The sarcoma had a fibrous capsule and was connected with nerve roots.

W. A. BRENNAN.

Blanc: Nerve Anastomosis in Paralytic Deformities (Las anastomosis nerviosas en las deformidades paralíticas). *Siglo méd.*, Madrid, 1917, lxiv, 661.

Blanc reports a clinical experience in the treatment of after-results of infantile poliomyelitis.

In two cases operated upon by Blanc the patients had suffered a paralysis of the anterior group of the leg muscles, the resulting deformity amounting almost to equinism. Blanc first practiced a prolongation of the Achilles tendon and eased the tibial anterior tendon and the extensors of the toes. He then sought out the anterior branches of the peroneal nerves, which innervate these muscles, and sectioning a length of nerve united its lower end to

another resected from the most posterior branches of the internal popliteal sciatic nerve. The upper extremity of the dissected peroneal branch nerve was inverted upon itself in the same manner as is done in nerve extremities of amputation stumps.

The results at the end of three months were highly satisfactory and showed a greater tonicity in the anterior muscles of the leg and some movements of dorsal flexion. It is probable that the nerves which activate the paralyzed muscles are not in a state of complete atrophy and that an incomplete regeneration is accomplished by means of the nerve anastomosis.

W. A. BRENNAN.

Clarke, J. M.: Gunshot Wounds of Peripheral Nerves. *Bristol M.-Chir. J.*, 1917, xxv, 61.

The nerve may be completely divided, partially divided, or injured by compression, scar tissue, callus or some foreign body. Location of the injury rests on an anatomical basis, aided by X-rays. The extent of the damage is estimated by motor and sensory paralysis, muscular wasting, pains, hyperæsthesia, trophic lesions and electrical reactions. Pain and hyperæsthesia mean partial injury; if these are replaced by analgesia and tactile anaesthesia, compression is probably occurring. Severe forms of trophic disturbance such as ulcers occur in complete division.

Secondary operation may be done after the wound is healed or after the amount of permanent paralysis is determined. Preliminary treatment con-

sists in keeping the limb wrapped, application of a splint to keep the paralyzed muscles relaxed, daily massage, and electrical treatment. A prophylactic dose of tetanus antitoxin is desirable. Operation is advisable: (1) in complete division; (2) where paralysis is stationary after four months; (3) where improvement suddenly stops with signs of compression; (4) where there is great pain; (5) with the occurrence of trophic ulcers. After suture, electrical treatment should not be begun for some time. Cases of nerve concussion recover in six weeks. Partial division should recover in from two to six months. The greater distance the site of the lesion is from the periphery, the longer it takes to recover.

Operative findings may show the following:

1. The nerve may appear to be normal.
2. There may be complete division of the nerve, with a bulbous swelling at the end of the upper segment, succeeded by a mass of scar tissue of variable thickness, and adherent to the surrounding tissues. The treatment adopted is to free the two ends of the nerve, cut off the upper segment through the upper end of or above the bulbous swelling so as to expose visible nerve-bundles with no excess of interstitial fibrous tissue, and suture with catgut. The junction may be wrapped in Cargile membrane or with saphenous vein, but often nothing is used.
3. There may be a bulbous swelling on the nerve, adherent to the track of the bullet, and it may be doubtful whether the nerve-fibres pass through it or are interrupted. In such a case the nerve is stimulated electrically above and below the bulb. If, in the case of a small or medium-sized nerve, not the sciatic, any muscles supplied by it contract, the scar is freed and wrapped in saphenous vein. If there is no response, the scar is excised and sutured.

4. A large nerve, such as the sciatic, may show symptoms of a partial division, and at operation part of the nerve show a scar. The best procedure is to take out a quadrilateral, including the scar, and, by splitting the nerve-trunk up and down, to bring the two ends together, leaving the intact portion of the nerve undisturbed.

5. The nerve may be intact, but pressed upon by a bullet or shattered bone. The treatment is to remove the cause of pressure; but although this relieves pain at the time, it is apt to return during the process of healing and prove intractable.

LISTER TUHOLSKI

McCurdy, S. L.: Injury of the Musculospiral Nerve. *Am. J. Orth. Surg.*, 1917, xv, 711.

Injury of the musculospiral nerve practically destroys the usefulness of the hand. When this nerve is severed or its continuity is destroyed in any manner, the extensor forearm group of muscles are inactivated with consequent inability to extend the fingers or to extend the hand upon the forearm. The flexors of the hand and fingers contract and produce in time an exaggerated contraction of the fin-

gers, the hand assuming a condition of claw hand. The author states that this was first described by Volkmann, and is known as Volkmann's ischæmic paralysis and contraction. Any force which may be brought against the musculospiral nerve in its course from the cervical vertebrae, along the brachial plexus, or along the humerus to the extensors of the forearm, will produce a condition of wrist drop. Obstetric paralysis, that variety of brachial injury which occurs during parturition, is not infrequent.

Musculospiral injury results most frequently from fracture of the shaft of the humerus and epiphyseal separation of the lower end of the humerus.

Another variety of musculospiral injury is due to gunshot wounds, where the nerve is severed in its course, without injury to the bone. When the entire nerve has been severed, there will be complete paralysis of all muscles in the extensor group, both of the thumb and the digits, in cases where the injury is in the neighborhood of the elbow. In advanced cases the deformity is quite marked; the hand assumes an angle of 45° or more, the wrist is flexed, the first row of phalanges is extended, and the second and third markedly flexed, assuming a claw shape.

Treatment is based upon the length of time which has elapsed from the time of injury to the time the case comes under observation. Section of the nerve, either in cases associated with fracture or following stab or gunshot wounds, requires immediate suturing of the nerve.

McCurdy records in detail several cases treated by himself. In one case he operated 5 days after the injury was sustained and sutured the ends of a musculospiral nerve. Owing to the movements of the arm, the lower end of the nerve had retracted so that the ends were about an inch apart. They appeared to have healed over so completely that it was necessary to freshen the ends.

They were brought end to end, and the nerve sheath sutured with No. 00 catgut, a very fine, curved needle being used. Five interrupted sutures were used to approximate satisfactorily the ends of the nerve. Another row of sutures was used to adjust what appeared to be the original environs of the nerve, after which the wound was closed with silkworm gut sutures. The patient made a splendid recovery.

The second case was similar. The man returned to duty as a railroad conductor within ten months of the date of the accident. He was greatly improved.

In a third case McCurdy transplanted the flexor carpi ulnaris into the extensor communis digitorum as follows: The muscle is first freed about four inches above the head of the ulna through an incision of about two inches.

The second step in the operation is to sever the flexor carpi ulnaris subcutaneously at the insertion into the carpal bones. A third incision is made over the dorsum of the forearm just above the annular

ligament, exposing and dissecting out the extensor communis digitorum tendon. This requires an incision about an inch or an inch and a half long. The flexor carpi ulnaris is now drawn through the incision on the outer surface of the ulna. In some instances it may be necessary to sever this muscle from the wrist by an open incision rather than subcutaneously, in order to free properly the end of the tendon from its attachment.

The next step is to pass a dressing forceps from the incision on the dorsum of the wrist underneath the skin around the ulna, through the first incision. The free end of the flexor carpi ulnaris is now drawn through underneath the skin to the dorsum of the

wrist. The fingers are overextended and held in this position by an assistant while the flexor muscle is sutured into the tendon of the extensor. It is best to split the extensor to permit the end of the flexor to be more securely sutured so that a more firm repair will result.

Operative interference is also required in the typical Volkmann's ischemic paralysis and contraction. The flexor tendons are stretched under an anæsthetic. A splint is used, and after months of effort the fingers are restored to almost a straight line. The operation in one case did not, however, restore normal range of flexion and extension, but permitted sufficient motion to restore partial use of the hand. PHILIP LEWIS.

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESES, ETC.

Kolmer, J. A.: The Diagnostic Value of Examinations of Cerebrospinal Fluid. *Med. Clin. N. Am.*, 1917, 1, 355.

It is readily understood that with the majority of diseases of the cerebrospinal system, accompanied by demonstrable changes in the cerebrospinal fluid, the diagnostic value of spinal puncture and an examination of the fluid is best appreciated with a complete analysis of the fluid by a physician who understands the underlying principles governing the pathologic changes which may occur. Aside from finding the specific micro-organisms of a disease in the cerebrospinal fluid, there is no other single specific change, except first, possibly, the Wassermann reaction, which, when positive, indicates that the patient is infected with syphilis and that the nervous tissues may be involved; and secondly, the colloidal gold reaction, which, when yielding a typical paretic curve, indicates paresis. Even in these latter conditions other data, such as a protein determination and total cell count, are valuable in aiding the diagnosis, as exemplified in the four reactions of Nonne, namely, a total cell count, protein determination, and Wassermann reaction with cerebrospinal fluid and blood-serum.

In acute meningitis, the cloudy or purulent fluid in which the micro-organisms are found by smear or culture, is sufficient for diagnosis, although cell counts and protein determinations furnish data indicating the severity of the infection and serve as guides, indicating regression or progression of the disease under treatment. In practically all other conditions more complete studies, according to the following outline, are necessary before the full value of a cerebrospinal fluid examination is to be gained:

1. Pressure as taken with the Landon manometer and in a uniform manner, preferably with the patient lying on the left side.

2. Physical appearance of the fluid.

3. Total cell counts made with fresh warm fluid and preferably with the Fuchs-Rosenthal chamber.

4. Differential cell counts made with direct smears of the sediment secured by thorough centrifugalization or by the Alzheimer method.

5. Protein determination, employing the Noguchi or Kaplan tests.

6. Sugar determinations, employing the simple and rather crude Fehling's reagent or the more accurate micro-method of Bang.

7. The Wassermann reaction, employing graded amounts of fluid up to and including a dose of at least 1.5 ccm.

8. The Lange colloidal gold test, employing an acceptable reagent.

9. Bacteriologic examinations if the presence of bacteria are suspected; by direct examination of stained smears of sediment or cultures of the sediment on appropriate culture-media. Animal inoculation tests may be employed for the detection of tubercle bacilli and *Treponemata pallida*.

EDWARD L. CORNELL.

Pepper, O. H. P., and Pearce, R. M.: Myeloma with Metastasis to Liver and Spleen. *J. Med. Research*, 1917, xxxvii, 171.

The view that true myeloma does not form metastases has been emphasized ever since the first recognition of this condition, and doubt has frequently been cast upon the few cases of myeloma in which it was claimed that metastases were found. After careful study of the evidence presented, the authors state that some of these cases scarcely seem to belong in the group of myelomata, while in still others the claim of metastasis formation seems to have been due to a careless use of the word metastasis, or to a misinterpretation of a direct extension of the myeloma process from bone to adjacent soft parts.

These errors, they believe, can be readily understood; the extreme confusion in the classification of the group of tumors and the variability of the

cell types make the proper identification of a border line case very difficult. In addition, some authors have described cases of myeloma in which there occurred a large skeletal tumor which they considered primary, and a number of smaller nodules also in the bones, which they called metastases. This the authors believe to be undoubtedly incorrect, as many cases with diffuse or multiple uniform involvements would tend to prove. There is, however, a small group of cases in which the tumor described seemed rightfully to belong to the myeloma group, and in connection with which there were found foci of identical tumor tissue at some distance from the bony involvement.

The authors give a summary of such cases as are found in literature, and report a case which they believe belongs in this group. This case was unusually interesting in that no definite nodules of myeloma were demonstrable by X-ray or at autopsy; and because there was found throughout the liver and spleen, which were grossly normal, a diffuse infiltration of microscopic foci of cells identical with those of the bony tumors. These findings seemed to justify a claim of true metastasis formation in this case.

From their study the authors draw the following conclusions:

A case of multiple myeloma was reported in which the tumor cells were of the bone-marrow plasma cell type. The tumor cells did not show granules by oxidase stains. Groups of identical cells were found in the liver and spleen.

The literature contains reports of authentic cases of multiple myeloma in which foci of the tumor cells were demonstrated in the liver, spleen, ovary, tonsil and lymph nodes. It is the opinion of the authors that these represent metastases rather than "homologous new formations."

GEORGE E. BEILBY.

Henderson, Y., and Haggard, H. W.: Observations on Surgical Shock; a Preliminary Note. *J. Am. M. Ass.*, 1917, lxi, 905.

The condition of surgical shock, unless associated with extensive hemorrhage, is always the result of prolonged and severe sensory stimulation. As stimulation of sensory nerves induces discharge from the suprarenal glands, it may be assumed that the rate and duration of secretion is proportional to the intensity of the stimulus. Whether a prolonged condition of excess of epinephrin in the circulating blood can produce shock is one of the questions attempted to decide.

Prolonged excessive secretion of epinephrin, if it occurs under pain, is not a critically important factor in the production of shock. It is, therefore, improbable that surgical shock is a result of excessive secretion of the suprarenals secondary to sensory stimulation.

Apparently the reduction of the carbon dioxide content of the blood by the excessive breathing under pain or other excitement results either in

loss of alkali, or a formation or retention of other acids. This acidosis, or reduction of alkaline reserve, whatever its details, is, at least in respect to respiration, clearly of a compensatory character, for otherwise the intense acapnia would always quickly result in a fatal apnoea, as in fact it frequently does. It is particularly noteworthy, in support of this conception, that in the experiment with ether in which the animal was made to rebreathe through a long tube, thus keeping the alveolar carbon dioxide tension at a nearly normal level, the rate and degree of ether acidosis was correspondingly decreased.

In the metabolism experiments in which observations of the oxygen consumption and carbon dioxide elimination were made before and after the production of shock, it was found that the condition of shock involves a profound depression of metabolism, the oxygen consumption falling 45 per cent in one experiment and 50 per cent in another. This depression of metabolism is progressive and ends in death.

The introduction of the gas mask in warfare has accustomed men to a form of apparatus by which rebreathing can be readily arranged. Fortunately, it is easily applicable on the battlefield where human material is regularly available for the study of shock. By this means it is hoped to get an adequate test of the question whether rebreathing will prevent or decrease the development of shock in severely wounded men as it does in animals under experimental conditions.

For those already in shock and breathing feebly, rebreathing involves a dangerous limitation of oxygen. In this condition the administration of percentages of carbon dioxide approximating the normal alveolar air by the same method used for administering oxygen is the measure which, in the light of ten years' work in a laboratory, is certainly worthy of trial.

EDWARD L. CORNELL.

Archibald, E. W., and McLean, W. S.: Observations upon Shock, with Particular Reference to the Condition as Seen in War Surgery. *Ann Surg.*, Phila., 1917, lxxi, 280.

The difficulties of transporting wounded from the trenches are graphically depicted. Being constantly within range of the fire of the enemy, the wounded are thus exposed to fatigue, cold, wet and prolonged loss of blood. These conditions greatly predispose to shock.

The author's observations can be summarized as follows:

1. Wounds of the chest and head very rarely present symptoms of shock.

2. Practically all cases of shock were wounds of the locomotor system, or of the abdomen.

3. In practically all of the recoveries, the patients were kept warm.

4. Fall of temperature was a fatal indication, death following when the temperature was below 92.

5. When shock was marked, the blood-pressure was below 75, or could not be obtained.

6. Pulse was always rapid and respiration was increased.

7. Hemorrhage involving a moderate loss of blood tends to aggravate shock. Intravenous salt solution, which is helpful in hemorrhage, is useless in shock; it acts rapidly but is not lasting, holding up blood-pressure only for a few hours. Colloid solution of 25 gr. in a liter of saline was more effectual in hemorrhage than the saline alone. Blood transfusion was disappointing, and while the color was improved and blood-pressure elevated, it had no more permanent effect than the gelatin and salt. Blood transfusion for loss of blood is not accompanied with the complex mechanism by which blood is continuously withdrawn from the circulation in shock. Pituitrin increased the pulse, but was transitory and of real value only in mild shock. Adrenalin is contra-indicated because of its constricting action on liver capillaries.

Diastolic blood pressure is of importance in advanced shock. Systolic at 100 with diastolic at 30 or 40 indicates shock. When intravenous saline fails to raise the diastolic pressure, shock is still present and the patient will probably die. If the systolic sound is first heard only during expiration, and becomes continuous only some ten to twenty mm. lower, there is always shock and blood-pressure is low. Such cases frequently die. Patients rarely recover whose systolic blood-pressure is 65 or below. Hemorrhage alone will not influence the blood-pressure materially unless accompanied by shock.

The author enumerates the causes of shock and concludes with the statement that while a low blood-pressure is one of the most constant signs of shock, it is neither the essential factor nor the cause. Blood transfusion, both experimentally on animals, and clinically, failed to overcome shock. The author believes that there is a local acapnia when the bowel is long exposed, but primarily it is more probably in the nature of an inhibition by which capillary tone is lost and the balance of the local chemical changes between blood and tissue or cell fluids is upset. Cold and fatigue predispose to shock, perhaps by cooling the blood.

Recent English work, the author states, has demonstrated in shock a serious loss of plasma into the tissues with a consequent rise in the hemoglobin, and the viscosity of the blood in the vessels. In shock produced by histamin, Dale and Laidlaw showed that one-half the plasma had disappeared into the tissues. It is believed that in shock thus produced the tone of the capillaries is lost and the blood stagnates. The author accepts this theory as the point of primary failure in traumatic shock. Contributing factors are lack of blood to the venous system, gradual failure of the heart and of the coronary supply. The capillary failure leads to insufficient oxidation, which results in asphyxial acidosis. The acid substances thus formed cause

the proteins of the tissue to imbibe water from the blood.

Hypertonic salt solution at twice decinormal strength would be of some promise, since its chief effect would naturally be to call back into the blood the plasma lost to the tissues. M. A. BEHNSTEIN.

Bartlett, C. J., and Ozaki, Y.: Phagocytosis in Vivo under Various Conditions. *J. Med. Research*, 1917, XXXVII, 139.

The authors believe that the great increase in knowledge regarding bacterial phagocytosis which has resulted from opsonic studies of the past decade and a half concerns chiefly phenomena demonstrated in vitro. It is evident that such phenomena may not always indicate the extent of phagocytic activity occurring in the immunizing processes as they take place in the living animal body. In other words, the same thing may or may not occur in vivo as in vitro.

In a recent report made by the authors it was evident that the relative number of cocci ingested by leucocytes as compared with those in fixed cells varied under different conditions. It seemed to them desirable to follow this observation further. In these in vivo experiments they were able to follow the process of phagocytosis as it is brought about by the activity of untreated native leucocytes and fixed cells in co-operation with the blood plasma.

From a long series of experiments which the authors give in detail, they draw the following conclusions:

The method of the estimation of phagocytosis in vivo by means of bacterial injection with subsequent microscopical examination of the tissues is available in order to study the processes of phagocytosis which actually take place within the living organs and tissues in normal as well as abnormal conditions.

The phagocytosis in vivo of micrococcus aureus by leucocytes seemed to be slightly lowered in acute phosphorus poisoning and occasionally after chloroform anesthesia. It was hardly interfered with by fasting of a moderate degree.

The phagocytosis in vivo by leucocytes did not undergo any marked deviation from normal after general anesthesia. On the other hand, it has been generally recognized that chloroform as well as ether anesthesia reduces the opsonic index to a more or less marked degree. The co-operation of some constituents of the blood plasma other than those in the serum may exert a compensatory influence upon the process of bacterial ingestion; this is the probable explanation for the discrepancy between the phagocytosis in vivo, and that in vitro, the authors believe.

The phagocytosis in vivo of micrococcus aureus by leucocytes showed a marked diminution in activity in the advanced stages of an acute general infection caused by the same micro-organism. The process they believe to be probably of specific nature.

The phagocytosis in vivo of micrococcus aureus

by leucocytes in the course of an acute general infection caused by bacillus coli seemed to show but little change from that in normal animals. This fact probably has some significance in considering secondary and mixed infections.

The authors draw attention to the fact that it has already been noticed that the bacteria introduced into the blood stream are chiefly detained by the spleen and liver, if the lungs be excluded, where the detention of bacteria is chiefly temporary. This peculiar biological property of the spleen and liver was, if not completely, partly lost when these organs underwent a marked degeneration. This was probably due to the lessened vitality of the macrophages present in these organs.

When the leucocytes became less capable of ingesting bacteria, the phagocytic tissue cells of the lung, spleen and the liver acted to a greater or less extent in a compensatory way for the deficient part of leucocytes. This fact is of great significance for the elimination of bacteria from the circulating blood.

GEORGE E. BEILBY.

Smith, E. F.: Embryomas in Plants. *Bull. Johns Hopkins Hosp.*, 1917, XXVIII, 277.

In April, 1916, the author announced the discovery of a new type of crown gall, one containing numerous leafy shoots, and he showed that he could produce it at will by making his bacterial inoculations in leaf axils where there was a dormant bud; that exceptionally in tobacco he had produced it on the blade of a leaf where there were no buds, and once in an internode; that frequently the secondary tumors were of the same type as the primary tumor, i.e., full of perishable leafy shoots; and finally, that he regarded it as a true embryoma comparable to those occurring in animals. Since that time the author has been experimenting continuously and now offers further data on the production of these anomalous crown galls which, following Adami's terminology of tumors, he considers to be atypical teratoid tumors. With one exception, all the illustrations used are of tumors which were the result of pure-culture bacterial inoculations, although the author has since discovered that leafy crown galls occur in nature on various plants, e.g., on the rose and on the carnation.

Crown gall is a common tumor due to a white rod-shaped polar-flagellate schizomycete, according to Smith. It occurs on many kinds of plants, wild and cultivated, but chiefly on the latter. In certain striking ways this tumor resembles malignant animal tumors. For earlier literature on its structure and etiology, and on the morphology and biology of the organism causing it, Smith refers to *Bulletins* 273 and 274 of the Bureau of Plant Industry, U. S. Department of Agriculture. He also refers to his article in the *Journal of Cancer Research*, April, 1916, in which he specially summarized his conception of its relation to human cancer; and in *Science*, June 23, 1916, in which he endeavored to answer various objections to his views.

The commonest form of the tumor, Smith states, is a sarcoma; that is, a hyperplasia developed out of conjunctive tissues. In 1906 for the first time this tumor was produced with a definite micro-organism by Smith and his associates, since which time they have produced hundreds of crown galls with pure cultures of their bacterium *tumefaciens*. Cancers occur, he therefore believes, not only in animals but also in plants, if his interpretation is correct.

The parasite was intracellular and invisible, or at least very hard to demonstrate in tissues, but can be isolated by the methods of the bacteriologist. It can also be isolated on slides, and stained by diffusion in sterile water from the cut surface of fresh young tumors, and is then seen to be about the same size and shape as when grown in cultures. It was not very abundant in the tumor, and was not demonstrable in the vessels or between the cells.

It did not kill the tissues, but stimulated them into abnormal growth by means of its diffusible products, acid and alkaline. Death of tissues came about in other ways, i.e., by loss of water or by the destructive action of other organisms, the naked tumor offering unusual facilities for their entrance.

The ordinary crown gall gave rise to parenchymatous tumor strands on which secondary tumors developed with the structure of the mother tumor. Many of these secondary tumors were seen especially on the Paris daisy, but so far as observed by the author not one of them was an embryoma.

Many of the experimentally produced tumors were embryomas; that is, sarcomas containing rapidly developing abortive parts of the young plant,—roots, stems, leaves and flower-buds or cells containing floral pigment. These tumors were caused by the same parasite as the ordinary crown galls, the difference between the two types of tumor being due to unlike reactions of the various tissues. If conjunctive tissue only was stimulated, a simple sarcoma resulted; but if, on the contrary, the infected conjunctive tissue cells were close to totipotent cells, then they also began to grow and a complex tumor resulted, an embryoma.

When the embryomas gave rise to secondary tumors, the latter were either embryomas, like the mother tumor, or simple sarcomas. In this particular, also, they followed the law of animal embryomas. The organs or tissue fragments in the embryomas were feebly vascularized and aborted at various stages of development, usually early. The organs and fragments of organs in these tumors were often monstrous, i.e., simplified, reduced, duplicated, fused, abnormally oriented, or asymmetrical; and frequently their tissues also were subsequently invaded by the sarcoma.

Monsters occurred frequently in nature and were produced repeatedly in various ways, e.g., by grafting or by fragmentation of eggs, but were either not sarcomatous or only accidentally so. This is the first time, so far as the author knows, that embryomas have been produced experimentally, and

certainly the first time they have been produced by means of inoculations introducing a micro-organism.

Whether epitheliomas and carcinomas can also be produced in plants by bacterial inoculation remains to be determined, but the author believes they can be. He has obtained the first stages of cell division in epidermal cells by bacterial inoculation and sees no reason to doubt that under favorable conditions the epidermis would continue to divide and would follow its own law of growth in tumor development, i.e., downward into the subepidermal tissues. This he leaves for further experiment.

Frequently normal tissues were torn and crushed by the enlarging tumor in mass invasion, but there was also an individual invasion on the part of tumor cells and vessels. The author did not determine whether surrounding tissues were also absorbed.

GEORGE E. BELLBY.

Simonda, J. P.: Study of Low Blood-Pressure Associated with Peptone Shock and Experimental Fat Embolism. *J. Am. M. Ass.*, 1917, LXX, 883.

In a series of experiments on animals, by injecting peptone and fat into a vein, symptoms were produced similar to those of surgical shock. A fall in blood-pressure was noted in both fat embolism and peptone poison. The following observations were made:

1. The drop in blood-pressure from peptone poisoning is very rapid, the lowest level being reached in thirty seconds. The drop in blood-pressure from fat embolism is slow, requiring several minutes to reach the minimum.

2. Recovery of the animal from non-fatal doses of peptone is much more rapid than from fat embolism.

3. In fat embolism the toxic effects of ether appear to be markedly intensified, and if the ether is not withdrawn the animal dies.

4. In peptone poisoning the greater part of the blood is accumulated in the liver and the veins of the splanchnic area. The accumulation of blood in any one organ is due to gravity. Thus, if the foot of the board to which the animal is fastened is elevated, the intracranial sinuses are found at necropsy to be greatly distended with blood. In peptone shock the low blood-pressure is due to a loss of tonus in the vessels of the splanchnic region. In fat embolism, the passage of blood through the lungs is mechanically interfered with.

5. Oedema of the lungs appears to be a fairly constant accompaniment of experimental fat embolism, but not of peptone shock.

6. A marked rise in blood-pressure from nicotin in peptone and anaphylactic shock was obtained only when the nicotin caused a temporary dyspnoea. The rise was due to the mechanical effects of respiratory suction on the reservoir of blood in the liver, and not to the action of nicotin on the vasomotor apparatus.

It was suggested that the mechanical effect of

dyspnoea might be of value in the treatment of any condition of low blood-pressure in human patients in whom there was a large reservoir of blood in the liver. This can be accomplished by respiratory suction by drawing the blood into the right heart.

Although the author has not used carbon dioxide in his experiments, he has observed such a rise of pressure in peptone poisoning and in fat embolism. It has been observed that dyspnoea causes a rise in blood pressure in both fat embolism and peptone poisoning. The difference in their behavior is as follows:

1. In peptone shock the rise is sharp, dropping when respiration becomes normal; in fat embolism the rise is more gradual and more sustained.

2. In fat embolism the same rise occurs from rapid respiration which follows removal of the anæsthetic.

3. A rise is also induced by vigorous artificial respiration by means of a bellows. Neither of these methods has produced a rise in pressure in peptone shock.

The author concludes that fat embolism can be dislodged from the lung by vigorous respiration with bellows, but there is a danger of forcing the embolus to the brain.

M. A. BERNSTEIN.

Schamberg, J. F.: The Causes of Reaction After Salvarsan. *Med. Clin. N. Am.*, 1917, I, 443.

A variety of factors may be responsible for the production of reactive phenomena, but some are relatively unimportant as compared with others. These various factors may relate (a) to the individual; (b) to the technique of administration, and (c) to the drug employed. There can be no doubt that individual susceptibility plays a part in reactions.

Variations in the drug with the consequent development of traces of impurities are more responsible for reactions than any other factor. Salvarsan of absolute chemical purity does not exist; it invariably contains certain impurities. The early vasomotor symptoms are due to impurities in salvarsan. The author has devoted much study to a search for the particular chemical variation which gives rise to these phenomena, but thus far his efforts have not been attended with success. He has, therefore, termed the substance X.

Substance X has a powerful vasoparetic influence. It induces dilation of the blood-vessels, followed in many instances by leakage of serum into the tissues. It is this serous exudation which gives rise to puffing of the eyelids or the lips which is at times observed. The paretic influence upon the vessels may be so severe in some cases as to lead to collapse of the patient. Whether the presence of substance X could play a part in the production of oedema of the brain or encephalitis hæmorrhagica in the cases in which these rare complications develop is rather doubtful, in view of the fact that these symptoms usually appear late.

EDWARD L. CORNELL.

McPherson, R.: Report of a Case of Cystic Lymph-
angioma. *Bull. Living-In Hosp.*, N. Y., 1911, XI,
161.

McPherson reports a case of cystic lymph-
angioma occurring in an infant who died on the
thirteenth day post-partum from severe intestinal
hemorrhages. The child was born with a large
cystic tumor covering the entire left thorax, ex-
tending up beneath the left clavicle and scapula and
down over the inner surface of the humerus as low
as the upper third of the forearm. In certain areas
the tumor extended beneath the muscles. Section
of the tumor showed it to be composed of cavities
of varying sizes partially filled with a pale straw-
colored fluid. Some septa were 3 mm. in thickness,
while others were very thin. Microscopically,
the septa were composed of fibrous tissue, through-
out which were numerous small cysts lined by
endothelial cells. The larger cavities were also
lined by endothelial cells which had been somewhat
flattened out.

H. B. MATTHEWS.

Hull, A. J.: The Treatment of Burns by Paraffin.
Canad. J. M. & S., 1917, xlii, 72.

A new treatment for burns by the use of a prepara-
tion of paraffin known as ambrine was carried out
in a military hospital by Sandfort. It consisted in
washing the burns with sterile water, drying, and
spraying a layer of ambrine over the surface. The
burns healed rapidly, constitutional symptoms
abated, pain was reduced to a minimum and scarring
appeared to be obviated.

Because of the fact that ambrine was a secret
formula, similar preparations of paraffin contain-
ing resin, essential oils and tars have been used.
Experiments resulted in the preparation of a
formula for paraffin No. 7. This contains: resorcin
1 per cent; eucalyptus oil 2 per cent; olive oil 5
per cent; paraffin melle 25 per cent; paraffin durum
67 per cent. When resorcin is not obtainable beta
naphthol 25 per cent may be substituted. The
amount of paraffin durum is increased to 67.75 per
cent. No. 7 paraffin is said to be quite as effica-
cious as ambrine.

The author describes the method of treatment as
follows: The burn is washed with sterile water and
dried. It is then covered with a layer of paraffin
at a temperature of 50° C. The paraffin may be
applied with a broad camel hair brush or by means
of a spray. A thin layer of cotton wool is then
placed over the burned area and a second layer of
paraffin applied. The dressing is completed by
applying wool and a bandage.

P. H. KREUSCHER.

Prat: Tetanus and Serotherapy (Tétanos et séro-
thérapie). *Bull. méd.*, Par., 1917, xxxi, 337.

From his experience with a large number of
cases observed in the war, the author is of the
opinion that antitetanic serum is not only pre-
ventive but is also curative. The latter fact appears
to him deducible from:

1. The amelioration observed in the prognosis
of actual tetanus cases, which is now only 37 per
cent in his personal cases; some of these deaths were
due to septic complications.

2. The evident effects produced by local injec-
tions of serum on the symptoms of pain and con-
tracture in benign and localized cases. They have
been observed as specially efficacious in localized
cramps.

The curative results were the better according
as the serum doses were larger. W. A. BRENNAN.

SERA, VACCINES, AND FERMENTS

Manwaring, W. H., and Crowe, H. E.: Rôle of
Hepatic Tissues in the Acute Anaphylactic
Reaction. *J. Immunol.*, 1917, ii, 317.

It was pointed out in 1910 that the pronounced
fall of blood-pressure, which is the essential feature
of the acute anaphylactic reaction in the dog, is
not due to a direct action of the foreign protein on
the sensitized blood-vessels but is an indirect
phenomenon, due to the explosive formation or
liberation of depressor substances by the liver.

This observation led the authors to study the
rôle of hepatic tissues in anaphylactic guinea-pigs,
by the application of perfusion methods to isolated
organs. Two hundred gram guinea-pigs sensitized
by a single intraperitoneal injection with 0.025
ccm. goat serum were tested from twelve to sixty
days after the injection.

The methods used were: (a) hepatic perfusion;
an afferent cannula in the portal vein, delivering
the perfusion fluid under constant pressure and
temperature; ligation of the remaining portal
vessels and of the vena cava below the liver; an
efferent cannula in the vena cava above the dia-
phragm; and (b) pulmonary perfusion; ligation of
the ductus arteriosus; an afferent cannula in the
pulmonary artery, delivering the perfusion fluid
under constant pressure and temperature; escape
of the perfusion fluid from the open left auricle; a
cannula in the trachea.

The normal liver had a slight detoxicating action
on foreign protein blood-mixtures, sufficient to
prevent the passive anaphylactic response in
subsequent tests with normal lungs. The de-
toxifying action, however, was never sufficient
to cause an appreciable difference in subsequent
tests with anaphylactic lungs.

The anaphylactic liver had a marked detoxicating
action on foreign protein blood-mixtures, usually
sufficient to prevent all but a trace of the anaphy-
lactic response in subsequent tests with anaphylactic
lungs. The detoxifying action was more pro-
nounced in perfusions with anaphylactic blood than
with normal blood.

The detoxifying action of the anaphylactic
liver, the authors state, is not due solely to the
presence of anaphylactic humoral elements. There
is evidently an acquired detoxifying function of the
fixed liver cells, and the detoxifying action is not

due to a removal or destruction of the foreign protein in the perfusion fluid. Their evidence pointed to the explosive formation or liberation of vasodilator and bronchodilator substances by the sensitized liver cells.

From their study the authors draw the following summary:

The liver of a normal guinea-pig, repeatedly perfused with a mixture of foreign protein and defibrinated normal or anaphylactic blood, produced little or no change in the toxicity of the perfusion mixture on subsequent tests with isolated anaphylactic lungs.

The liver of an anaphylactic guinea-pig, similarly perfused, usually rendered the perfusion fluid almost completely nox-toxic for these lungs.

This reduction in toxicity was not due to the presence of anaphylactic humoral elements, but to a specific functional action of the fixed hepatic cells. The reduction in toxicity was not due to a removal or destruction of the foreign protein in the perfusion fluid.

Evidence pointed to the explosive formation or liberation of vasodilator and bronchodilator substances by the sensitized liver cells.

GEORGE E. BEILBY.

Smith, C. E., and Solomon, H. C.: *Bruck's Sero-Chemical Test for Syphilis; a Report of Four Hundred Cases Compared with the Wassermann Reaction.* *Boston M. & S. J.*, 1917, clxxvii, 321.

Bruck's original technique is given, but with some modifications by the authors. To 2 ccm. of distilled water is added 0.5 ccm. of serum and the mixture shaken thoroughly. To this 0.3 ccm. of acidum nitricum, 25 per cent of U. S. P., or that of German pharmacopœia, specific gravity 1.149, is added slowly from a precision pipette, care being taken not to allow it to flow down the sides of the test tube. Gentle shaking while the acid is being added prevents the formation of a flocculent precipitate in normal serum. Each tube must be shaken in the same manner to obtain uniform results. It is allowed to stand at room temperature for six or seven minutes; if allowed to stand 15 or 20 minutes, practically all sera will give a positive reaction. The tube should be shaken gently once or twice during this period. Then 16 ccm. of distilled water at room temperature is added; this should be allowed to flow gently down the side of the tube without disturbing the precipitate. In the normal reaction the precipitate will begin to mix with the solution at once and the fluid become cloudy, while in syphilitic cases the precipitate will be composed of large flakes which show little tendency to mix with the solution or to cloud the fluid. The tube is then inverted three times but not vigorously. In the positive test there will be found a gelatinous precipitate upon standing, while the slight precipitate in the normal is re-dissolved by inverting the tube.

The serum is obtained by allowing the blood to stand at room temperature for an hour and then

centrifuging. Serum that has stood for some time may be used as well as bloody serum. The same result is given with or without inactivation. Postmortem blood also gives results. The best sized test tube to use is 13 by 1.9 cm.

The conclusions drawn are as follows:

1. Results of the Bruck sero-chemical test in 405 cases are presented. In 101 of these cases there were definite clinical manifestations of syphilis, in which the Wassermann and Bruck tests agreed positively in 74 cases, or 75 per cent. The two tests agreed negatively in 12 instances, and were at variance in 15.

2. In the group which showed syphilis of the nervous system there were 64 cases of clinically certain general paresis, of which the Wassermann and Bruck tests agreed in 54 instances, or practically 85 per cent. In other forms of central nervous system involvement the agreement was 100 per cent in the 15 cases tested.

3. In the cases with no apparent involvement of the nervous system the agreement was somewhat less, being 76 per cent. This may be in keeping with the fact that the Wassermann test was not so strongly positive in these cases.

4. The advantages of the test are: (a) the short time required to make the test; (b) the limited amount of apparatus necessary; and (c) the simplicity of the technique.

5. The disadvantages of the test seem, for the most part, to be bound up in the personal variations that are apt to occur.

6. There is probably a quantitative chemical difference in the protein content of syphilitic and non-syphilitic sera, the nature of which is not understood. It is hoped that this may be brought to light in the near future in the field of chemistry.

C. A. BOWERS.

Thomas, H. B.: *Arthritis and Foreign Protein; Chronic Rheumatism Relieved by Intravenous Injections.* *J. Am. M. Ass.*, 1917, lxi, 770.

Typhoid vaccine is the agent usually employed. It is well established that typhoid vaccine does not relieve symptoms by the formation of antibodies, but that the benefit derived is due to the protein content of dead bacteria. These are thought to produce a rise in temperature and hyperleucocytosis, just as other proteins, such as milk, maltose, horse serum, chicken serum and sodium nucleinate are thought to do.

Thomas' experience coincides with that of Mueller and Weiss: the higher the fever produced, the more favorable the result. The production of fever, therefore, is probably more therapeutic than is the formation of antibodies. Rest in bed and a search for the focus of infection are the first essentials in treatment. Gastro-intestinal reaction is less severe if seven hours have elapsed since the last meal.

The tonsils, teeth, gums, sinuses, ears, eyes, urethra, prostate, gall-bladder, heart, gastro-

intestinal tract, and the female pelvis should be examined as possible sites of infection. In a few cases there were no demonstrable foci. A patient who had a severe multiple osteo-arthritis of practically all the joints revealed no focus after careful autopsy. A dosage of 30 million typhoid vaccine intravenously is the usual dose in the subacute and chronic cases of osteo-arthritis, and if these cases react moderately, the amount is raised cautiously at intervals of two or three days to 75 million bacteria at each injection.

Thomas saw no alarming symptoms or harm done in 86 cases. Moderately advanced heart, kidney disease, and pulmonary tuberculosis are not considered contra-indications for the treatment, except that more caution should be observed.

The immediate effect of the vaccine ranges from an uncomfortable sensation to severe chills, high fever, and emesis. The chronic cases show less reaction. In practically all the cases relief from all joint pains a few hours after the injection is a pleasing effect. The pains usually reappear after an interval of two or three days, but this interval decreases with the number of injections. After a course of from twelve to twenty-four injections covering a period of from one to two months, the patients are usually cured.

In reviewing the end-results, the relief from pain is not permanent in more than 30 per cent of cases. The remaining cases have done much better under this than under other forms of treatment.

J. J. KURLANDER.

BLOOD AND LYMPH VESSELS

Sencert, L.: *The Treatment of Vascular Wounds at the Front* (De la traitement des plaies vasculaires à l'avant). *Lyon chirurg.*, 1917, XIV, 640.

Sencert says that in the case of a wound of one of the large vessels the life of the patient depends upon the extent of the cutaneous lesion. If this is large, death occurs as a rule; if it is small, the blood may escape into a neighboring splanchnic cavity or it may fill the surrounding vessels. In a certain number of cases the hemorrhage is insignificant and there is spontaneous hæmostasis.

Spontaneous hæmostasis is more frequently observed in cases of complete section of the vessel than in lateral wounds and also in cases where the vessel has been subjected to contusions and ruptures of its interior coat. Sencert has observed 20 cases of injuries to the axillary, femoral, and popliteal vessels arriving at the ambulance in which there was already spontaneous hæmostasis.

At the first aid station the application of an Esmarch band should be reserved for cases where it is probable that the hæmorrhage is due to injury of a large vessel, as constriction of a limb is dangerous and exposes the patient to the risk of an ischæmia or gaseous gangrene.

If the cutaneous wound is very narrow, Sencert advises that it be closed by a Kocher hæmostatic

clamp. For the treatment of large wounds in the ambulance Sencert advises ligature and forcipressure. If there is no hæmatoma and if the ligature is aseptic and placed in a healthy part of the vessel, gangrene rarely occurs.

Compression of the collateral channels by a hæmatoma increases the danger of gangrene. The risk of gangrene is also very imminent if a thrombosis threatens the origin of the collateral channels.

In the cases of wounds of the popliteal, primary femoral and lower third of the axillary arteries, ligature is dangerous. In these cases vessel suture should be attempted. Success depends upon: (1) an aseptic condition of the wound; (2) the placing of sutures in a healthy arterial wall without existing ruptures of the internal coat.

When the external cutaneous lesion is narrow the patient may show symptoms of diffuse hæmatoma or internal hæmorrhage simulating shock. For the diagnosis of hæmatoma, the rhythmic expansion and the intermittent blowing sound revealed by the stethoscope and synchronous with the pulse are important, but they may be absent.

Sencert indicates two symptoms which are rarely absent in cases of arterial lesions, pain and immobility. When a large artery is injured the patient complains of a deep, violent pain which is not increased by external pressure. The limb is completely immobilized by muscular contractures. As a rule lesions of the large arteries are associated with a certain degree of shock.

Diffuse hæmatoma should be operated upon at once in order to remove the menace of ischæmic or infectious gangrene. Sencert advises immediate operation, even if the external wound is punctiform, in order to prevent infection and secondary hæmorrhage. It is easier and less dangerous to operate at once than after the formation of an aneurismal sac. In operating, preventive hæmostasis is important. Sencert rejects the Esmarch band and finger compression as insufficient and recommends incision and dissection of the artery above the hæmatoma. A strong catgut is passed under the artery without tying it, angulation of the artery produced by its elevation on the catgut is sufficient to stop the current. For opening the hæmatoma large incisions and flap formations are recommended. The vascular lesion when uncovered is ligatured.

Sencert has operated upon 42 hæmatomata. Of those involving dangerous arteries, 5 cases of hæmatoma of the axillary region gave 1 death and 2 cases of gangrene; 9 cases of hæmatoma of the thigh gave 2 deaths and 2 cases of gangrene; 5 cases of hæmatoma of the popliteal region gave 2 cases of gangrene. Simultaneous ligature of the vein does not increase the danger of gangrene.

In cases of dry arterial wounds, diagnosis may be difficult. Sencert recommends examination for pain and immobility and if the symptoms are positive, operation is recommended.

W. A. BRENNAN.

Gregoire, R., and Mondor, H.: Notes on Vascular Wounds (Notes sur les plaies des vaisseaux). *Lyon chirurg.*, 1917, xiv, 645.

Since June, 1916, the authors have observed 80 important vascular wounds. Of these only 11 reached the ambulance showing persistent hæmorrhage, 8 being arterial and 3 venous. There were no immediate signs of hæmorrhage in 23. In such cases the vascular wound may be obliterated by the projectile, or by the internal coat of the vessel if divided, or even by a clot. Silent cases of this kind may recover spontaneously without any complication, but also it may happen that the plugging clot may become detached and the man may die by hæmorrhage which has no septic origin. Hæmorrhage may likewise occur from the elimination of a necrosed piece of tissue which opens a contused vessel. For these reasons in injuries of the larger vessels it is always well to make a thorough examination of the seat of the wound. No patient with a vascular wound should be discharged without a proper operation.

In 16 cases there was diffuse hæmatoma without aneurismal symptoms. In this early stage the swelling rarely shows pulsation, noted in only 4 cases. Two cases showed later pulsation. Two arteriovenous hæmatomata were revealed by a manifest thrill, but intervention showed that there was no direct communication between the artery and vein.

One arteriovenous aneurism, the carotid artery and the jugular vein, was operated by ligation. Six cases of ischæmic gangrene necessitated primary amputation. Seven secondary amputations were performed for consecutive ischæmic gangrene.

In all cases the technique employed was ligation of the vessel or vessels above and below the site of injury. The authors do not favor ligation at a distance except in cases where the artery is deprived of its sheath for a certain length.

The immediate results in the 80 cases gave 74 recoveries and 6 deaths. Two of the deaths were due to secondary hæmorrhage and two to anæmia.

W. A. BRENNAN.

Leriche, R., and Heltz, J.: Results of Peri-Arterial Sympathectomy in the Treatment of Post-Traumatic Reflex Nerve Troubles of the Babinski-Froment Type (Résultats de la sympathectomie péri-artérielle dans le traitement des troubles nerveux post-traumatiques d'ordre réflexe-type Babinski-Froment). *Lyon chirurg.*, 1917, xiv, 754.

The authors give very complete clinical histories of 18 cases of reflex nerve disturbances consecutive to war wounds which they treated by peri-arterial sympathectomy. They have attempted to show what may be demanded and expected from sympathectomy in the treatment of contractures and paralysis of the Babinski-Froment type.

The operation is performed by a thorough dissection of the cellular arterial sheath carrying the sympathetic vasomotor fibers. This denudation

should be for a length of 10 to 12 cm. or if the artery is occluded the whole thrombosed segment is resected.

The results of the operations carried out demonstrate several facts:

1. The operation is followed, after a short period of arterial constriction during the manipulations of the vessel, by an elevation of the blood pressure in the operated limb.

2. Operation is always followed, after the period of arterial constriction, by an intensive vasodilatation, lasting for several weeks and resulting in a considerable elevation of the temperature of the subjacent segment of limb.

3. The resection of an obliterated artery produces the same reaction of vasodilatation, but even more intensive and lasting than sympathectomy by denudation.

4. Both operations have a striking action on the voluntary contraction of the muscles whose motor power was abolished before.

Circulatory disturbances in paralysis and reflex-contractures are constantly accompanied by local vasoconstriction which may temporarily disappear by artificial heating. Hence the favorable action of peri-arterial sympathectomy is satisfactorily explained by the vasodilatation and consecutively increased temperature produced; and concerning muscular contracture, by the intensified blood irrigation of the muscles which bring more oxygen and stimulates the process of dissimulation.

The disappearance of reflex disturbances, contractures, numbness, cyanosis, œdema, etc., is not always definitive at once, and it may be advisable to aid the effects of vasodilatation obtained by sympathectomy by hot baths of paraffin and by suitable exercises. But in any case the resultant improvement, even in the most severe cases, is sufficient to justify the intervention.

Although sympathectomy is not proposed for cases in which the vasomotor and thermic disturbances are not pronounced, the intervention is inoffensive. In no case where the operation was done was the patient's condition aggravated, and in most cases the authors have observed a period of change which tended towards recovery.

W. A. BRENNAN.

POISONS

Manwaring, W. H., Yoshio, K., and Crowe, H. E.: Fate of the Foreign Protein in the Acute Anaphylactic Reaction. *J. Immunol.*, 1917, ii, 511.

The authors group the principal theories concerning the nature of the acute anaphylactic reaction into two classes. Those of the first class picture the reaction as due to an increased receptor apparatus in the fixed tissues. Those of the second class conceive it as a result of an increased proteolysis by the body fluids. Believing that evidence of the validity or non-validity of these

theories might be obtained by applying perfusion methods to isolated organs and tissues, they therefore carried out a series of experiments.

To 50 per cent defibrinated anaphylactic guinea-pig blood was added 0.25 per cent to 1 per cent egg white or goat serum, and the mixture was incubated fifteen minutes. No decrease in the amount of the foreign protein was observed, when compared with a control mixture of the same protein in normal blood.

The immediate humoral anaphylactic reaction cannot be looked upon, according to the authors, as a hydrolytic cleavage or destruction of the foreign protein sufficient to prevent its giving quantitatively the specific precipitin reaction.

One-tenth of one per cent to 1 per cent egg white or goat serum in Locke's or Ringer's solution or in 25 to 50 per cent defibrinated normal or anaphylactic blood was repeatedly perfused through the organs of normal animals, and no decrease in the concentration of the foreign protein was observed on subsequent titration with a specific precipitin. Similar perfusion of the tissues of anaphylactic and immune animals gave results identical with those having normal tissues.

The authors found the tests with the lungs of anaphylactic guinea-pigs to be of special interest. These, perfused with the specific protein, either in Ringer's solution or in normal or anaphylactic blood, were thrown into typical anaphylactic reactions. The reactions, however, were not accompanied by a demonstrable decrease in the concentration of the foreign protein in the perfusion fluids. No demonstrable destruction or binding of the foreign protein by the fixed tissues took place during the acute anaphylactic reaction.

From their study the authors determined "that perfusions of isolated organs and tissues with dilute foreign proteins furnish no evidence of a measurable destruction of the foreign protein by the blood serum, nor of an appreciable destruction or binding of the foreign protein by the fixed tissues during the acute anaphylactic reaction." GEORGE E. BEILBY.

Anders, J. M.: Diagnosis of Focal Sepsis. *Boston M. & S. J.*, 1917, cxxxvii, 319.

One should attempt to recognize the primary septic foci before systemic consequences become well established. In some cases, other diseases and habits influence the condition, as well as the infection; in others, a cure of the focal infection leads to a disappearance of the general symptoms.

Acute diseases commonly caused by septic foci are generalised tuberculosis, rheumatic fever, endocarditis, pericarditis, myocarditis, pyæmia, gonorrhæal arthritis, cholecystitis and appendicitis. Chronic diseases are arthritis deformans, myocarditis, myocardial degeneration, arterial fibrosis, chronic nephritis and septicopyæmia. The foci may be multiple, and may be primary and secondary.

It is of advantage to associate certain clinical

features with infections in particular parts of the body; the primary infection focus in arthritis deformans, acute rheumatic fever, chorea, endocarditis, gastric ulcer, appendicitis, myositis, myocarditis and glomerulonephritis is usually located in the head.

Infection cannot be attributed to one septic focus until all other possibilities have been ruled out. When making a diagnosis, the following regions should always be kept in mind as possible foci: the teeth, tonsils, lungs, pleura, the posterior urethra, prostate, seminal vesicles, kidneys, bladder, uterus, tubes, ovaries and Bartholin's gland. The radiograph is a valuable aid and bacteriological examination is important.

In conclusion, the diagnosis of a primary focus embraces the discrimination of non-focal infections and the establishment of its seat and particular etiologic variety, both from a clinical and bacteriologic viewpoint, supported by X-ray findings in many instances, and also by expert opinion in cases of tonsillar and sinus involvement. The diagnosis of a primary oral focus demands the isolation of the streptococcus viridans.

C. A. BOWERS.

RADIOLOGY

Cole, L. G.: Localization of Foreign Bodies. *Am. J. Roentgenol.*, 1917, iv, 455.

The method described by the author is one previously published by him but brought up to date by embodying the principles of several methods used at the front. It consists essentially of a special caliper so placed and arranged that the shadow of a foreign body falls within a vertical ray passed through a ring and cross wire placed on the opposite sides of the part being examined. These points are marked on the body. The tube, which is underneath the supporting table, is then shifted 15 centimeters from the vertical ray and a second exposure made. By means of a sliding scale devised by Holland the depth of the foreign body can be directly ascertained without the use of mathematical calculations, merely using the data obtained by the previous examinations. A second caliper, somewhat like the other, and called the surgeon's caliper, is adjusted on the part examined in such a manner that the information obtained by the roentgenologist can be directly utilized by the surgeon during the operation. A semicircular piece of block tin similar to Flint's profundimeter may be used in conjunction with the above to correlate the part with a cross-sectional anatomy in order to determine the relation of the foreign body to important anatomical structures. Detailed description with diagrams of appliances and technique used is given by the author. ADOLPH HARTUNG.

Holding, A. F., and Long, W. B.: The Truth About Radio-Active Therapy in Malignant Growths. *J. Am. M. Ass.*, 1917, lxi, 982.

Of all the methods for cure of cancer that have been offered, the only one that has endured to the

present day is radical surgical removal. With the advent of the radio-active substances, radium and the roentgen ray, more was claimed for them than they were actually able to accomplish, for it is doubtful whether, with the exception of basal cell epithelioma and certain growths with the morphology of sarcomata but with low virulence, radio-active measures *per se* cure malignant tumors, except in the most infrequent instances; and surgery is still the method resorted to. However, it must be acknowledged that radiotherapy has become a valuable adjuvant to surgery in preventing recurrence after the main mass has been removed, and in ameliorating the suffering of patients with an inoperable growth.

The squamous cell epithelioma, because of its structure and clinical behavior, is a neoplasm most unsuitable for radiotherapy. The author has never seen such growths affected by radium or the roentgen ray unless the dosage was pushed to such a point that to the physiologic action of the ray was added the action of a caustic. On the contrary, the effect on basal celled epitheliomas is striking, with no more dosage than is necessary to produce a physiologic effect.

It is always easier to reduce a metastasis than the primary growth, because the cells on account of their recent advent in a given locality have not had sufficient time to establish vascular relations with the stroma, and consequently such vessels are apt to be rudimentary in structure and easily obliterated.

Assuming that the foregoing hypotheses are true, as the author believes them to be, he urges that all operable tumors, basal cell epitheliomas excepted, be treated surgically at the earliest possible moment, but that all such cases receive the benefit of pre-operative and postoperative treatment with radium and roentgen rays, or both. The author also urges that every case of inoperable tumor should be given the benefit of radiotherapy, for while no promise of cure can be given, more relief can be obtained in this than in any other way.

W. A. EVANS.

Gray, B. F.: Some Essentials in Dental Radiography. *Dental Cosmos*, 1917, lix, 874.

After a short description of some of the fundamentals of roentgenologic technique and interpretation, the author calls attention to some of the sources of error such as shadows cast by the overlying antrum and mental and palatine foramina lying adjacent to some of the apices. Excepting these, he states that a "dark area" about a root is essentially an area of bone disintegration which means a focus of infection in practically every case. Partially filled root canals may harbor infection, even though it has not progressed to the stage of producing bone disintegration at the apex of the tooth. This possibility should be considered when the patient has systemic troubles believed to be of infective origin.

ADOLPH HARTUNG.

Duane, W., and Greenough, R. B.: Report of Results of Radium Treatment at the Collis P. Huntington Memorial Hospital by the Cancer Commission of Harvard University. *Boston M. & S. J.*, 1917, clxxvii, 359.

The authors present a collective report of 642 cases of cancer and allied conditions treated by radium. The methods of obtaining the data are briefly stated, the variety and locations of the lesions treated are tabulated, and results obtained in different classes are mentioned. The conclusions arrived at are as follows:

1. Many cases of advanced, inoperable or recurrent cancer may be given benefit by treatment with radium.

2. In such cases the relief may include one or more of the following advantages: relief of pain, diminution of discharge, less offensive discharges, relief of hæmorrhage, diminution in the size of tumor masses, even to their total disappearance; and improvement in the general condition of the patient. To these must be added the undoubtedly beneficial psychic effect upon the patient.

3. In a very small number of advanced and apparently inoperable cases, improvement may occur such as to permit a radical operation to be performed.

4. In a certain proportion of cases of superficial non-metastasizing types of cancer (about 35 per cent) and in a much smaller number of cases of metastasizing cancer, radium is capable of destroying the clinical manifestations of the disease. Sufficient time has not elapsed to report these cases as cured, and they are being kept under observation. In a limited number of cases, recurrence after apparent destruction of the lesion has taken place. In certain situations, as on the eyelids, radium treatment of lesions is to be preferred to operation.

5. In keratoses, papilloma and other benign skin diseases regarded as precancerous, radium is effective in destroying the clinical manifestations of the disease in from 48 to 60 per cent of cases.

6. In myelogenous leukæmia, the beneficial effects of radium are pronounced, and although recurrence of symptoms may take place, the clinical advantages of radium therapy are very marked.

7. In malignant lymphoma, lymphosarcoma, and Hodgkin's disease, the lesions appear to be especially sensitive to radiation, and definite though temporary benefit is obtained. When in accessible situations, it would appear that the disease can be controlled by radiation for a considerable period of time.

8. In the treatment of many other tumors and diseases radium has been used with benefit, depending largely upon the extent of the disease, its depth in the tissues, and the practical ability to apply sufficient radiation to modify or destroy tissue or tumor growth. Among the conditions in which radium treatment has proved of special value may be mentioned: recurrent or inoperable carcinoma of the cervix or of the body of the uterus,

Hodgkin's disease and malignant lymphoma, myelogenous leukemia, inoperable squamous cell carcinoma of the tongue, jaw and buccal mucous membranes, in non-metastasizing epidermoid cancer and in the more benign lesions of keratoses, papilloma, and other so-called precancerous conditions.

9. Radium therapy has proved so far to be of little benefit in recurrent carcinoma of the breast, carcinoma of the stomach and intestine, carcinoma of the glands of the neck by extension from cancer of the tongue, mouth and lip, and in general in deeply-seated metastatic extension of cancer from any region.

10. The use of radium in prophylaxis of recurrence after radical operation for the cure of cancer is not advised. Where serious doubt exists as to the complete removal of the primary tumor, and where the location of the suspicious area is superficial, accessible, and of small extent, radium may be used with benefit; but where a large area is to be considered, as after operation for breast cancer, because of the difficulties of covering the whole area with sufficient radiation, the treatment is not to be recommended.

11. The combination of radium therapy and operation, by which a tumor, otherwise inoperable, is excised as thoroughly as possible, the remaining tissues cauterized, and subsequently subjected to radiation, has yielded satisfactory results in several cases. This method of procedure is especially adapted to the more advanced cases of rodent ulcer, involving the face. After a period of radiation and observation of the open granulating wound, extending over several months, secondary plastic operations have been performed to close the defects, and the results, up to the present time, in a very small number of cases, have shown no return of the disease.

12. Of 642 cases treated with radium in this series, 314, or 49 per cent, received definite benefit.

13. Although many cases of advanced carcinoma show no appreciable benefit from radium treatment, it is also true that in no case yet observed has radium appeared actually to accelerate the growth of tumor tissue. Patients have suffered pain and inconvenience from the effects of radium burns in certain instances, but these have been of a temporary character. The constitutional effects of heavy doses of radium are unpleasant, and severe nausea and depression may occur; but these, also, are chiefly temporary in character. With continued and excessive dosage, very profound constitutional effects may be obtained. A serious diminution in the number of white cells in the blood is observed after continued heavy dosage. This is a more lasting phenomenon, and may be of serious importance in relation to the patient's resistance to infection. In no other respect has radium been found to exert an unfavorable action upon the patient.

14. The considerable expense of purchase and the difficulties and dangers of administration of

radium therapy are more than justified by the results obtained.

ADOLPH HARTUNG.

Pancoast, H. K.: Malignant Disease of the Throat and Sinuses: Review of Cases Treated by Radium and Roentgen Rays. *J. Am. M. Ass.*, 1917, lxx, 986.

In the treatment of inoperable malignant growths, surgery doubtless has the widest adaptation of the many procedures now employed. In most instances, the lesion must be attacked by a combination of the several methods now at command. While radium and the roentgen ray are by no means the only other suitable agents, they probably have the widest field of application next to surgery. When large surfaces must be exposed, such as mammary carcinoma, abdominal or pelvic tumors, roentgentherapy is the choice between the two agents. When growths originate in the cavities, such as the mouth, throat and ear, deep cross-firing by the roentgen ray or possibly by radium is essential; but the possibility of adding to the dosage and to the efficiency of the treatment by direct local applications of radium has a distinct advantage.

When implanted directly into sarcomatous tissue, radium generally causes little or no sloughing if the growth responds promptly. It is advisable to produce as rapid subsidence of the growth as possible in order to minimize the possibility of metastasis during the period of treatment. The author's experience has seemed to prove that growths insufficiently treated at the periphery may be stimulated to more rapid proliferation at this portion. Sarcomatous growths, especially in the tonsillar region, are more amenable to treatment than carcinomata. The author advises that treatment be continued for some time after the apparent complete disappearance of the growth.

A number of cases are reported which are both interesting and instructive.

W. A. EVANS.

Ingersoll, J. M.: Stereoscopic Roentgenograms of the Head. *Tr. Am. Laryngol. Ass.*, N. J., 1917, May.

The longer stereoroentgenograms have been used, the more certain has been the conviction of their practical value, for they give definite information in regard to the nose and the nasal accessory sinuses, the brain and many of its blood vessels, the ear and the mastoid, which cannot be obtained in any other way. The size and boundaries of the maxillary and frontal sinuses can be distinctly seen. If there are any septa, tumors or foreign bodies in these cavities, they can be accurately located and defined. The ethmoidal and sphenoidal sinuses overlap each other, and are thus somewhat masked, but their position, relative to each other and the orbit and the other surrounding structures, can be clearly distinguished.

Skill in interpreting the roentgenograms can be more easily acquired by the surgeon than by the

roentgenologist, for the surgeon has the decided advantage of being able to verify and correct the findings in the roentgenogram while he is operating. If the surgeon will carefully study the stereoscopic pictures before operating, compare his interpretation of the picture with the condition which he finds in the operation, and then study the picture again after the operation, he will soon acquire great skill in interpreting the stereoscopic plates.

In studying stereoscopic plates they should be examined from both sides. First, put the plates in the stereoscope with the film sides toward the mirrors. This will show the structures as they are seen in the operation, with the external parts in the foreground and the deeper structures in the background. Then by reversing the plates in the stereoscope, turning the smooth sides of the plates toward the mirrors, the structures will be seen from the inside of the skull.

The technique for making stereoscopic antero-posterior radiographs through the frontal sinuses is described, as also the technique for making stereoroentgenograms of both mastoids on a single pair of plates.

These plates, when developed, are placed in the stereoscope, with the one having the right eye images in the right light box of the stereoscope, and the one having the left eye images in the left light box. With the glass side of the plates turned toward the mirrors of the stereoscope the mastoids are viewed from the inside of the skull, while with the film side of the plates placed toward the mirrors the mastoids are viewed from the outside of the skull.

Well, E. A.: Roentgenotherapy of Peripheral Tuberculous Adenopathy. *Am. J. Roentgenol.*, 1917, IV, 449.

The author states that roentgen treatment is justified in all tubercular adenopathies, whether inflammatory or suppurative. In the former, it alone is sufficient to effect a cure, although additional forms of treatment may be added to combat the patient's tubercular diathesis and increase his power of resistance. The closed suppurative form should have the pus evacuated by fine aspirating needles as a preliminary to intensive treatment by the roentgen ray. If fistulae and cutaneous ulcerations are present, surgical cleansing should precede the radiotherapy.

The technique employed consists of sending through a variable number of skin areas hard rays of 8 or 9 Benoist, filtered through 4 mm. of aluminum. Each area receives 10, 12, or even 14 H units, divided in a number of consecutive doses. One or more series are given at variable intervals.

Roentgen treatment thus administered does not cause rapid growth of the ganglionic masses nor any spreading of the tuberculous condition, as has been maintained by some authors. It has been successful even when administered under adverse conditions of environment. The author believes it to be the method of choice. A number of case

histories are included to demonstrate the efficiency of the treatment.

ADOLPH HARTUNG.

Donoghue, F. D.: Mesothorium and Combination Methods in the Treatment of Cancer. *Boston M. & S. J.*, 1917, cxcvii, 365.

By combination methods the author means surgery, chemotherapy, as represented by borocholine, with or without selenium in the colloidal state, and ray therapy either in the form of the roentgen ray, radium or mesothorium, together with the intravenous injections of thorium. The value of individual therapeutic agents in the treatment of cancer is briefly reviewed and the conclusion reached that the use of none of them alone will produce as good results as a properly considered combination of them. He cites numerous cases treated by various combinations of the above with the results obtained. Several cases of keratoses and epitheliomata treated only by mesothorium are also included.

The author arrives at the following conclusions:

All superficial ulcerations and all precancerous conditions yield readily to local ray therapy. Moderate doses should be used at the beginning, not exceeding 30 mgm. hours at one dose. If there is no response, choline injections are given intramuscularly as a preliminary to a second dosage. Large ray doses are indicated for deep cancers, which should be made accessible to the surface, so that there is a certain application of the rays to the malignant cells, and there should be means provided for the draining of decomposition products.

A desirable thing is to cause a disappearance of the cancer cells rapidly enough to overcome its growth, and slowly enough to prevent too much cancer toxin from being set free into the system.

In all cases of carcinoma of the breast, the follow-up treatment by chemotherapy and ray therapy, as represented by the X-ray, is desirable.

There should be some properly correlated method of treatment under some device so that when a surgeon has done what he thinks best, and recurrence, which occurs in the greater majority of cases, takes place, there should be some method known so that these patients are not exploited by charlatans, to drift despairingly from one person to another because there is no authoritative voice to indicate a rational course for them to pursue.

The substances necessary for massive doses must be so handled that all the twenty-four hours' activity may be utilized, and that the tremendous loss that exists through wide distribution and limited ray use may be obviated.

Massive doses should be reserved for large growths, where it is possible to have complete drainage. Growths on epithelial surfaces, especially where there is free lymphatic anastomosis, should be treated by chemotherapy, ray and excision, without extensive dissection.

Where there are metastases, no treatment is other than palliative. Marked cachexia is also a contra-indication to operation.

ADOLPH HARTUNG.

MILITARY SURGERY

Porter, W. T.: Further Observations on Shock at the Front. *Boston M. & S. J.*, 1917, CLXXII, 326.

Observations regarding the blood pressure of soldiers at the front under various conditions are given by the author, who describes his experiences in a very vivid manner. His conclusions follow:

1. The blood pressure is not lowered under habitual bombardment. These observations were made at Neuport, at the Mort Homme and on the Somme.

2. The blood pressure is not lowered under barrage fire of a violent nature.

3. Shock is probably not immediate, but develops some time after receiving the wound.

4. Fat embolism is a cause of shock. Typical shock has been produced by the injection of olive oil into the jugular veins of animals. In more than a thousand freshly wounded cases, aside from a few abdominal cases, the only shock seen was in three cases of fractured femur, or multiple wounds of the subcutaneous tissue, in which fat embolism probably existed.

5. The low blood pressure of shock is increased from 15 to 30 mm. of mercury by increasing the aspiration of the thorax. The author cites cases to show the value of administering carbon dioxide in shock. Enough gas was used to double the respirations. Great care should be exercised in gradually reducing the carbon dioxide respirations.

C. A. BOWERS.

Marshall, W. H.: Shell Shock. *J. Mich. St. M. Soc.*, 1917, LVI, 396.

The author divides shell shock, or war shock, into two groups: (1) those due to explosions in the immediate vicinity of the soldier, and (2) those cases or neurasthenic states due to physical and psychical stress and fatigue, greatly resembling what in civil life is called "nervous breakdown." The etiological factors may be violent explosions, very slight physical traumatism, noxious gases, prolonged anxiety, cold, wet and hunger, scenes of horror, loss of comrades, etc. Seasoned soldiers, while not immune, do not seem to have as severe symptoms as recruits and recover much more rapidly.

About 10 per cent of all cases had had previous nervous breakdowns. Shell shock was rarely seen in the severely wounded. Many of the patients belonged to the lower mental category. The pathology is not definitely established. Punctate hemorrhages have been seen in the brain, an increase of globulin and also blood cells have been found in the cerebrospinal fluid, while the endocrine glands have come in for their share of the blame. The onset is usually sudden, either in the trenches or immediately after return from them. A period of unconsciousness is very common, often followed by a dazed semi-conscious condition. There is a characteristic facial expression of terror, and a retrograde amnesia which improves gradually.

Patients complain of terrifying dreams at night or in the half waking state which leave them distressed and exhausted. General tremors, dizziness, tics, defects of speech, usually stammering, occasionally aphonia, temporary blindness with shaky vision thereafter, hyperacusis and many other symptoms go to make up the clinical picture. There are almost invariably sensory disturbances, mental dullness and confusion. Officers often present anxiety neurosis and are afraid of assuming responsibility. In making the diagnosis malingering must be excluded.

A Wassermann should be taken to rule out active syphilitic brain disease. Recovery is tedious, with tendency to relapses. The treatment includes rest, and if possible, isolation, sleep by means of hypnotics, and an endeavor to gain the patient's confidence. Psychic contagion must be guarded against. Aphonic patients are often lightly anesthetized and induced to talk with the purpose of keeping them talking until awake.

R. B. BETTMAN.

Fitzgerald, J. G., and Robertson, D. E.: Report of an Outbreak of Diphtheric Wound Infection Among Returned Soldiers. *J. Am. M. Ass.*, 1917, LXI, 791.

For some months wounded men of the Canadian expeditionary force, on whom amputations of arms or legs or both were necessary, have been returned to Toronto for further orthopedic treatment. Such patients were under the care of the Military Hospitals Commission Command, "D" Unit. During the first week in May, 1917, as a result of a thorough examination of suppurating stump wounds, one or two cases were observed which strongly suggested diphtheric infection. Between May 20 and June 7, 1917, 67 men with suppurating wounds, chiefly amputation wounds, were swabbed. Of this number 32 were found to be suffering from bacillus diphtheriae infection. In addition to these wounded men who were so infected, a nursing sister with a slight wound of one index finger was also discovered to be suffering from diphtheric infection of the finger.

It was extremely probable, therefore, that patients with diphtheric wound infection were being returned to Canada from overseas. Since a routine bacteriologic investigation of all cases of suppurating wounds had not been made, it was impossible to learn who was the original source of infection.

Since it has been observed that possibly 1 or 2 per cent of normal healthy persons are carriers of bacillus diphtheriae, it was a matter of interest that, as a result of the bacteriologic examination of the nose and throat swabs of all the patients examined and of the contacts, only two carriers were found. Six men who had most marked symptoms suggesting skin diphtheria improved greatly after antioxin was given.

The treatment in all cases was practically the same. The men were isolated, were given diph-

theria antitoxin and their dressings were done with a rigid regard for asepsis. It has also been recommended that in future a routine bacteriologic examination of all suppurating wounds be made; also that in no case should dressings of infected wounds be undertaken without rubber gloves. It is regretted that, because of the pressure of other work, a Schick reaction could not have been done on all these cases.

EDWARD L. CORNELL.

Latson, T. B.: *Surgery Next Door to the Front.*
Lancet, Lond., 1917, cxliii, 488.

Wallace sums up war surgery as being "in a great degree a matter of when and where to operate, and how best to move the wounded man to the place where he will win back to health."

No operations should be done in any mobile unit so long as the patient can be conveyed in a reasonable time to an immobile unit which has all the facilities of the modern operating theatre and of modern nursing. It has long been recognized that for the successful treatment of an abdominal wound the number of hours which have elapsed between the time that a man was hit and the time at which he arrives at the operating unit is inversely proportional to his chances of recovery. As the principles of wound treatment have developed, it has become clear that rapidity should be aimed at in all cases and the ideal should be to get every case back to the casualty clearing station at the quickest moment. The actual number of hours is not the only factor to be considered, as some cases suffer so severely from shock that to get them to the casualty clearing station in the shortest time would result in their arriving moribund, and it is necessary in some cases to delay the journey several hours or to use some means of transport other than the most rapid if it is likely to lead to less jolting on the journey.

The subject then falls under two heads: first, collection and evacuation; to consider whether every wounded man can be brought to the casualty clearing station in the shortest possible time, which in part of the line may be four hours or under, and in another part twelve hours or over; and if evacuation of all cases to the casualty clearing station within this time is impossible, to decide how to carry selected cases, and which cases should be selected. Secondly, prevention of shock and collapse; to consider what can be done by the general principles of civil surgery; by the application of special appliances for certain types of cases; by selection of means of transportation for serious cases.

The time before a wounded man's arrival at the casualty clearing station is partly taken by his being carried from one post to another and partly by the time which he remains at such a post. It is clear, then, that any speeding-up in the collection and evacuation of cases must either be done by faster transportation between these posts or by shorter periods during which they are kept at the various posts. The time that any form of trans-

port takes to move over a given road cannot vary much; and it is possible that very rapid movement does more harm by causing increased shock than it benefits by conveying the patient more quickly. If any time is to be saved, it must be done by shortening the periods during which the patient remains in the various stations. Part of this time is taken up by examining, dressing and feeding the patient, but for the remainder he is in the ward resting until it is his turn to go on to the next station. If transports were ready so that every patient could be sent on the moment he was dressed and fed, every case would arrive at the casualty clearing station in the minimal period of time. This is clearly impossible, for cases coming into the advance dressing station in numbers would have to be dressed and fed simultaneously; and if cases arrived one by one, a fresh transport would have to be called out for every minor case, resulting in a gross waste of transports. Also in many places collection from the advance dressing station to the main dressing station can only occur by night, and it may be inadvisable to send certain cases at certain times of the day, either because of the day's heat or the night's cold.

Since the ideal that every wounded man arrive at the casualty clearing station in the minimal time evidently cannot be attained, all that can be done is to make the average time for all wounded cases as short as possible by efficient organization. Much can be done to send selected cases in the minimal time. Where early operation may save a life or limb, there is warrant for taking greater risks by going over roads under observation of the enemy in daylight and by using a transport for a single case, the extravagance being justified by reason of the urgency. This should be done in all cases where the abdomen has been opened and the man is fit to move; also in all wounds of the bones and joints. Roads under observation over which traffic is not allowed by day should be open to field ambulance transports for selected cases, and the transport should be at the right place at the right moment.

To have the transport ready at the right spot and at the right moment is not easy. It is very important to have good communication between the main dressing station and the advance dressing station and again between this and the regimental aid posts ahead. In this way the medical officers in charge of the stations can notify one another that a case is coming along, and if a transport is not there to convey it, one can be gotten. For this reason it would be well if the main dressing station and the advance dressing station had telephone connection. It is invaluable for getting patients to the casualty clearing station in the minimal time.

The prevention of shock and collapse resolves itself into keeping the patients warm. In some instances infusion is necessary, but must never be done as a substitute for getting the patient warm, but as an accessory to this. Hot water bottles in

large numbers are chiefly depended upon. Numerous blankets around the patient are the next factor, also hood, stockings, etc. Shock is enormously diminished by immobilization of injured limbs. No case of fracture of a long bone should pass the advance dressing station without immobilization. Fracture of the femur should be put in a Thomas splint, a fracture of the leg in a back splint with foot piece and two side splints, a fracture of the forearm in an internal angular, and a fractured humerus should be treated by binding the arm to the side or putting it in a Jones arm splint. All extensive wounds of muscles and of joints should be put in splints, and every wound near a joint should be treated as though it involved the joint. A wound of the knee-joint travels best in a Thomas splint.

Every wound involving the abdomen or chest should be conveyed in the semi-sitting position with the knees bent. The degree of shock to which the patient will be subjected depends much upon the smoothness with which a transport moves. A motor ambulance car is the very poorest transport and a horse ambulance wagon little better; a litter or travois is best.

The cases are passed so quickly from one unit to another that they are never long under the medical care of one man until they arrive at the casualty clearing station, increasing the difficulty of making a diagnosis and determining a line of treatment, and affording the possibility that the line of treatment adopted by one medical officer may be changed by the next. It is generally worse to change treatment than to carry through to its conclusion an inferior line of treatment. It is important to standardize lines of treatment, and to insist that medical officers in the forward area begin these, and that those on the lines of communication and at the base continue them.

An accurate diagnosis can seldom be made by a medical officer who sees a case for only a short time. Many wounds of the buttock ultimately prove to have penetrated the pelvic cavity, so it is well to have every wound of the buttock, other than superficial through-and-through injury, classed as an abdominal case.

Careful notes should be made on the back of the field medical card at each station regarding the wound, dressings, pulse rate, administration of morphia, etc.

Indications for operations in the field ambulance are few. Abdominal cases which are too bad to be sent on to the casualty clearing station, but in which operation gives some slight hope of recovery, are rare. Cases needing immediate amputation are rare. Cases of bleeding from a single large vessel seldom find their way to the main dressing station, as the patients are dead before arrival, but when such cases do occur, it may be necessary to ligate the vessel.

Cases of bleeding from more than one small vessel in a large muscular wound are not many; when they

do occur, it is probably best to excise the wound and insert tubes according to the Carrel treatment. The author has not seen a case of head injury in which operation in a field ambulance came within the bounds of discussion.

V. C. HUNT

Goodwin, T. H.: War Surgery. *Mil. Surg.*, 1917, 211, 279.

Sepsis has proved to be a very serious and general complication of almost every class of wounds at the front. The cause is the extreme pollution of the soil in the fighting area, due to the extensive manuring for cultivation. The badly destroyed and devitalized tissues furnish a most favorable nidus for the growth of any bacteria which may have gained entrance to the wound.

At the field ambulance and casualty dressing station the patient is first given an injection of antitetanic serum. The field dressing which usually has been put on too tightly should be taken off and as much dirt and blood as possible washed away. Hopelessly torn and damaged tissues should be removed. Where necessary the patients ought to be anesthetized, the wounds enlarged and mechanically cleaned and counter drainage established. The wounds should not be sutured. Bleeding arteries should be exposed and ligated rather than an attempt made to check hemorrhage by tamponing the wounds. Antiseptics have proved disappointing; adequate drainage and mechanical cleansing form the most essential steps.

Collapse and shock which result usually from hemorrhage or exposure to cold, wet, hunger, as well as from injuries to viscera or large bones, or from long ambulance rides, are best treated by rest, warmth, hot drinks, or if contra-indicated, hot saline per rectum. Gas gangrene usually occurs within three days. The temperature is subnormal. Treatment consists of free incision, removal of dead tissues, thorough cleansing of the wound, removal of foreign bodies, hydrogen peroxide irrigation and establishing efficient drainage.

Fracture wounds should be explored under anæsthetic and treated as any other wounds, foreign bodies and completely detached bone fragments should be removed, free drainage provided for and the limb immobilized. At the casualty dressing stations humerus fractures are best treated by application of short wooden splints and by bandaging the arm to the side, while femur fractures are usually held by Thomas knee splints or Page splints. At the base more complicated methods can be used for the purpose of getting and maintaining correct apposition, but plates and screws, etc., should be avoided.

Knee-joint wounds are more serious in consequence than those of any other joint. For the more serious cases the joint should be freely opened and drained and continuous irrigation used. Wounds of the head require expedient operation for the sake of cleansing. Otherwise operation is on the whole less frequently necessary than has been be-

lieved. In injuries to the spinal cord it is interesting to note that an indirect injury producing a concussion may give symptoms very similar to those following direct trauma. Penetrating wounds of the chest if not immediately fatal have a good prognosis. Absolute rest, free use of morphia if necessary, is essential. Hæmothorax should not be tapped within the first week because of the danger of producing another hæmorrhage. Infection of hæmothorax is common.

The majority of cases of gunshot wounds of the abdomen die on the field. Primary operation for intestinal wounds is indicated if the patient is seen within the first 24 hours and is in good condition. Wounds of the kidney seldom require operation unless there is continuous bleeding. Trench foot or frost-bite is due to prolonged exposure to a low temperature, especially associated with wetting and a lowered general condition. Prophylaxis is infinitely more important than any treatment. Loose boots thoroughly greased, change of socks, dryness if possible, and exercise, will aid greatly in warding off frost-bite. The trench foot washing stations have done much to reduce the incidence of this affliction. The gas mask is a good protection against gas attacks. The treatment of gas cases consists chiefly in absolute rest and oxygen, expectorants and venous section in the badly cyanosed. R. B. BETTMAN.

Speed, K.: Prompt Removal of Foreign Bodies in Gunshot Wounds; Arguments in Favor. *J. Am. M. Ass.*, 1917, lxi, 1079.

With the equipment now at hand, it seems best to remove foreign bodies remaining in the tissues after gunshot as soon as conservatively possible. It is commonly known that some small foreign bodies will remain in well-vascularized tissues, become encapsulated and cause no harm. On the other hand, without reliable statistics, it is probable that a large proportion of gunshot wounds suppurate and indicate removal of the foreign body for that reason, or for pain or functional interference.

Suppuration, drainage, convalescence, late secondary operations after return to service, with all the handling and expense incident thereto, are a drag on resources. Could not an appreciable portion of this outlay be curtailed by prompt removal of foreign bodies? Because wounded men are conveyed to casualty clearing stations, it is there that foreign bodies should be removed, with restrictions, so that the wounded may then, within a few hours for the most part, be on the first step to recovery. If suppuration follows, its course is shorter, since the foreign body is removed. There is far less likelihood of gas or other infection. Time, dressings, the number of medical corps assistants, transportation expense and home hospitals are curtailed, and a larger proportion of wounded men can be retained near the active field forces and sent back without home travel. There are

various complications which might be partly obviated, such as long draining, secondary sinuses from tissues with foreign bodies lying within, secondary hæmorrhages, and the psychologic effect on men who retain in their bodies these pieces of metal. Loss of blood, shock, and anatomic inaccessibility prevent the treatment of some gunshot wounds by this method.

EDWARD L. CORNELL.

Aubourg and Barret: The Function and Use of the Various Types of Radiologic Installations in the Army (*Rôle et utilisation des divers types d'installations radiologiques aux armées*). *J. de radiol.*, Par., 1917, ii, 548.

The experience of the authors confirms the opinion that in war surgery radioscopy can and should replace radiography. The fact which dominates the radiologic service in war is the necessity of examining all the wounded by radioscopy; radiography is and must be exceptional. Such examinations as seeking and locating a projectile, and those of a thoracic nature, etc., are all radioscopy.

There is a difference, however, in the treatment of fractures. If radioscopy is sufficient for the diagnosis of a fracture, it can be safely asserted that radiography is insufficient for its treatment. Radiography is then necessary, not ordinary but perfect radiography, which shall give the maximum of structural details, stereoscopic if necessary, to judge of the site of fragments and projectile sequestræ, etc. The tendency to concentrate in one center for each army the wounded with important bone lesions convinces the authors that in such a central hospital there should be not a radioscopy but a perfect radiographic installation, such as would give to surgeons specializing in these lesions the maximum indications for treatment, since the preservation of a limb is often involved. This applies not alone to cases of fracture, but also to bony lesions of the face, head, etc., where radiologic examinations are necessary to establish the prognosis.

W. A. BRENNAN.

Small, C. P.: Equilibrium Tests for Aviation Recruits. *J. Am. M. Ass.*, 1917, lxi, 1078.

Because of the unusual conditions confronted by the aviator, the physical examination of candidates for this branch of the government service is more rigid than for any other branch. Among the most important tests are those for determining the sense of equilibrium. The Barany rotating chair or the Jones modification of the chair is used.

Three tests are made: the "nystagmus," the "pointing" and the "falling." The technique of each test is given.

EDWARD L. CORNELL.

Acker, R. B.: Observations by a Junior Surgeon of the John B. Murphy Hospital Unit with the British Expeditionary Forces in France. *Mil. Surg.*, 1917, xli, 295.

Acker states that the British Medical Corps organization may at present be considered the

most perfect of its kind. There is an effort made toward more uniform surgical treatment and grouping of wounded in special hospitals under specially qualified men to handle those cases. The proper care of gunshot fractures is of great importance; such cases have suffered a great deal from personal hobbies of surgeons at the various medical stations between the firing line and the base hospital, the splint being changed and the fracture manipulated many times. If the ideal treatment, which places a permanent splint at the firing line and sends the patient directly to a fracture hospital, is impossible, the next best thing to do is to place the fracture in temporary immobilization and transport the patient directly to a fracture hospital to remain until recovered. There are a number of special fracture hospitals in France and England, but many gunshot fractures still go through the relay of hospitals with the changes of splints.

Drainage is the first essential in the treatment of wounds. It is best to remove fragments of metal as soon as possible. Accurate localization of shell fragments or bullets should be accomplished with the aid of X-ray plates. In especially trying cases the use of the fluoroscope is of value. Soft rubber tubing is favored for drains. Hot boric dressings, frequently changed, with thorough drainage, are of considerable value in suppurating wounds. After suppuration subsides and healthy granulations appear, the wound is wholly or partly closed by sutures.

The Dakin solution has considerable merit, especially if it is begun shortly after the infliction of the wound, before suppuration is well established; the suppurative process may be shortened and the wound sutured much earlier. It appears that where the suppuration is well-started, this treatment has very little influence on the course of healing. In wounds with a foul-smelling discharge it is very efficacious as a deodorant. Prolonged use in wounds of this type seems to delay healing. It cannot be used as a hot dressing, but must be freshly prepared and kept from the light in well-corked bottles. After thorough drainage of the wound, the solution is most efficacious if instilled into the drainage tubes at frequent intervals. Irrigation with any solution, except in a limited number of special cases, is not practiced.

Continuous irrigation of wounds has many drawbacks. The treatment of wounds with hypertonic salt solution or packing with saline tablets, as recommended by Wright, was much in vogue for a time, but was found to produce dehydration of the tissues and retard healing.

In head injuries conservative treatment is advised. Spinal puncture is often of value in relieving symptoms of pressure and is a helpful aid in diagnosis. If operation is indicated, great care should be taken with the dura, which should only be opened when absolutely necessary. In wounds of the face and jaw, the dentist is of great assistance in applying

splints, using the teeth as an anchorage. Resulting deformities can be much improved by the use of autogenous bone transplants and plastic skin flaps.

Patients with chest wounds bear sepsis for prolonged periods with good results. In one series of 100 cases, there was 15 per cent mortality. They are all treated expectantly and made comfortable in bed with a back rest. Danger of infection is much greater in shell and bomb wounds than in bullet wounds.

Relatively few abdominal injuries reach the base hospital; they are usually kept in the field ambulances and clearing hospitals. Many of them have been exposed to the weather for hours after injury and have been transported in a jolting ambulance. Shock is present and must be combated before operation is attempted. Results in both operative and non-operative cases are disappointing. Rifle bullet wounds of liver and kidneys without continued hemorrhage do exceedingly well without operation; so do bullet perforations of the stomach, provided the latter was not distended with food at the time of injury. Approximately 60 per cent of wounds of the colon recover without operation.

Shell wounds of the abdomen are invariably accompanied by infection and are very fatal. Gunshot fractures of the long bones are most difficult to treat; there is usually marked comminution, and in some cases complete loss of sections of bone. Cleansing and drainage are of first importance. Immobilization is secondary. If much destruction of the limb is present or if there is a beginning gangrene, amputation is indicated.

Arm wounds as a rule do better than corresponding wounds in the leg. In wounded joints the limb should be fixed in best adaptation for use, if ankylosis is to result. Infected wounds of joints should be freely opened, and where there is much destruction of the bones, amputation is required.

Operations on wounds of the spinal column are not justifiable, except when the X-ray shows a foreign body pressing on the cord. Spinal injuries result badly. Secondary hemorrhages from wounds are quite troublesome and require packing in cases of hemorrhage from small vessels, and ligation of large vessels.

Tetanus is relatively infrequent since the introduction of the antitoxin prophylaxis. The prophylactic dose is usually from 500 to 750 units, given as early as possible. Most of the cases of tetanus were of severe type and in spite of the prophylaxis, as well as vigorous treatment, proved fatal.

In cases of gas gangrene if the infection is local in the form of emphysematous cellulitis, prompt, efficient opening of the wound to the air is the proper treatment; when the gangrene spreads, amputation is the only choice.

In nerve injuries no repair of the nerves should be attempted until the wounds are entirely healed.

As regards anesthetics, ether was the one of choice. Local anesthesia was useful, especially

in suturing small wounds. Gas was used only in very short operations. Spinal anaesthesia was very useful in cases of poor general condition requiring amputation.

L. R. GOLDSMITH.

Cumston, C. G.: A Surgical Post on the Firing Line. *N. Y. M. J.*, 1917, cvi, 604.

After some months of war it became evident that early operations gave the best results and for this reason advanced surgical posts have been established along the firing line.

The subterranean post described by the author was located only 300 metres behind the first French trench on the slope of a hill. It consisted of one shelter nine by three metres, constructed with metal, and divided into a receiving room, sterilizing room and operating room; a second bomb-proof shelter measuring ten by two metres for a ward, and a third one for the personnel. It is highly important that the wounded men should have a feeling of security in order to obtain rest during convalescence.

The operating room was constructed so that as complete asepsis as possible could be carried out. The ground was cemented, the walls of brick were covered with a thin layer of cement, and the entire interior was coated with a layer of washable white material. The operating table was the regulation metal one used in the French ambulances. The room was furnished with hot and cold water. Three acetylene lamps gave excellent lighting.

The operating room communicated with the bomb-proof ward by a short corridor. Each bed was a stretcher covered with a mattress, sheets, and blankets; the beds were placed one above the other as in Pullman sleeping cars. A heating apparatus warmed the room. Two wells 100 metres deep gave plentiful water supply. The personnel included four surgeons and ten male nurses.

This surgical post was one of the first to be established, and was an experiment. It was in activity for three weeks, during which period 127 wounded were received and 71 major operations were done. Out of the 71 operations there were 19 deaths. The operations were mainly injuries to the limbs, cranium, and abdomen; of the latter there were twelve laparotomies with a mortality of 66 per cent. Eight laparotomies were done for intestinal wounds with seven deaths; two for wounds of the liver, with one death, and one for resection of the omentum with recovery. This is a

good showing, when the serious nature of the wounds is considered.

At the end of three weeks the French had advanced two and a half miles beyond the advanced surgical post, so that it no longer fulfilled its purpose and was abandoned.

A. H. HIXSON.

HOSPITAL, MEDICOLEGAL, AND MEDICAL EDUCATION

Patterson, F. D.: The Relation of the Physician to Some of the Problems of Modern Industry. *Penn. M. J.*, 1917, xx, 832.

Industrial corporations and business organizations have increased their efficiency and capacity for output at a terrible toll of human life and suffering.

Statistics for 1916 in Pennsylvania record 251,488 accidents and 3,587 fatalities. Metal products works, railroads and other public service branches, mines and quarries prove most hazardous occupations.

Causes of industrial accidents include: (1) unguarded dangerous machinery; (2) ignorance of employees as to dangerous conditions; (3) unsafe methods of work; (4) recklessness; (5) speeding up; and (6) fatigue.

Prevention of accidents can be furthered by the following means:

1. An awakening of public conscience, and a development of human responsibility.

2. Safety devices handled by safety men, who have acquired the safety habit. The prevention spirit is as important as the safety device.

3. The education of new employees to dangers in their particular work, and training in safe methods.

4. Physical examination of applicants for employment and annual re-examination of all employees, classifying them according to physical qualifications.

5. Preventive medicine with special regard to those engaged in dangerous trades.

6. The collection of all dusts and fumes at their points of origin.

7. Employment of a competent doctor in every industry.

8. A change in curriculum of all medical colleges to fully meet the requirements of industrial medicine.

H. J. VAN DEN BERG.

GYNECOLOGY

UTERUS

Anderson, R. R.: Syncytioma Malignum; Review of Literature and Report of a Personal Case of Unusual Interest. *Northwest Med.*, 1917, xvi, 259.

Anderson reports the following case:

The patient, aged 22, had one child at full term two years before the present trouble. In September, 1900, following an attack of pleurisy which lasted three weeks, the patient had an abortion at about six weeks. She was put to bed for ten or twelve days. Six weeks later she had a severe hæmorrhage, after which she was curetted and several fragments of supposed placenta removed. About a month later another hæmorrhage occurred, so severe that it was necessary to pack in order to control it. Another curettement followed and an examination of the uterus was made to determine the cause of the hæmorrhage; only a few small shreds were found and removed. No microscopic examinations were made.

Hæmorrhages occurred in November and December, 1900. There was more or less uterine hæmorrhage until May, 1910, although the patient was not confined to the bed.

Nineteen months following the onset of the trouble the uterus was about three times the normal size, the left side being larger than the right. At abdominal operation a soft, spongy growth was found involving the left half of the fundus of the uterus which was adherent to the sigmoid. The left tube and ovary and nearly one-half of the fundus containing the soft spongy growth were removed. Sections of the growth were made and found to be a malignant syncytioma.

In October, 1911, another hæmorrhage from the uterus occurred. A tumor-like mass about the size of a hen's egg was found in the fundus of the uterus at the site of the former growth. This projected somewhat into the uterus and was not pedunculated, but was oval in shape, soft and easily torn, yet was so firmly attached to the uterus that it had to be removed with scissors. Following the removal of this mass, the uterus was packed and the patient put to bed, where she remained for eight weeks. Microscopic examination of this mass showed it to be an organized blood clot.

March 19, 1915, the patient gave birth to a ten-pound infant, normal in every respect.

EDWARD L. CORNELL.

Calderini, G.: Sarcoma of the Corpus Uteri [Un cas de sarcoma del corpo dell'uteri]. *Ann di ostet. e ginec. Milan*, 1916, xxxviii, 505.

Calderini refers to the literature of sarcoma of the body of the uterus, and reports a personal case in a

woman of 65 years. A spheroidal mass could be felt in the pouch of Douglas but it was doubtful whether this was a uterine tumor or a retroverted uterus. No definite diagnosis could be made. A median laparotomy was done. The omentum and transverse colon were adherent to the tumor which apparently was the uterus and was easily excised by hysterectomy. The woman died three days later from bronchopneumonia.

A complete anatomical and microscopical study of the tumor was made. It consisted of the uterus with the tubes and ovaries. The fundus and posterior face of the uterus were only slightly modified; the anterior face showed nodules and a large patch of about 5 cm. diameter deprived of peritoneum with a very irregular surface and evidently constituted of neoplastic tissue very friable in consistency. It was here that the neoplastic tissue was united to the intestinal loops from which it was detached during operation.

The microscopical examination of sections showed the neoplasm to be small round-cell sarcomatous tissue.

Veit's statistics show that one of every 37 uterine cancers is a sarcoma. W. A. BRUNNEN.

Davis, A. B.: The Control of Uterine Hæmorrhage. *Bull. Lying-In Hosp. N. Y.*, 1917, xi, 155.

Davis states that while uterine hæmorrhage may occur at any time from birth to the end of life, it is most frequent during the child-bearing period of a woman's life. This flow has a wide range as to cause, amount, duration, and severity. Bleeding from the vagina is occasionally seen in the hæmophilic infant during the first four days of life. It is usually accompanied by bleeding in other parts of the body, and local treatment is of little value.

From 1890 to 1909 there occurred in the Lying-In Hospital 18 such cases, and later during a period of one year 12 of these cases appeared. By the infusion of twenty to thirty ccm. of fresh human blood serum three times every twenty-four hours these infants were saved.

In certain individuals anæmia and a depleted physical condition may cause excessive and frequent loss of blood. The treatment in these cases is regulation of the mode of life, adjusted diet and tonic treatment.

In discussing hæmorrhage during pregnancy, labor, and the puerperium, the author doubts that he has ever met with a true case of menstruation during pregnancy. There is, however, occasional unmistakable evidence that the capacity of the uterine cavity is not fully occupied by the contained ovum in the early months of pregnancy, and it is therefore conceivable that a flow of blood may

appear coincident with the periodical congestion of menstruation without causing decidual detachment. At such times pregnant women should avoid nervous and physical exertion. The greater number of hæmorrhages occurring during pregnancy have their origin at the site of some degree of detachment of the placenta. During labor this may continue an active cause. After delivery hæmorrhage can come from but two sources, the placental site or laceration.

The treatment of threatened abortion consists in the application of a light ice-bag over the lower part of the abdomen and the use of some form of opium. In the treatment of hæmorrhage in connection with inevitable and incomplete abortion the indications are the same. In the early months packing the cervix and vagina will control the hæmorrhage. Within twenty-four hours after packing, the uterus should be curetted with a dull instrument, swabbed with half strength tincture of iodine and packed with five per cent iodoform gauze. The gauze is removed within twenty-four hours. During the fourth and fifth months better results may be secured by emptying the uterus in two sittings, packing with gauze for twenty-four hours and then removing the placenta and fœtus.

In the treatment of placenta prævia it should be remembered that all patients are better risks if treated in a hospital. The number of methods advocated seems to indicate a lack of reliability. In the writer's opinion cesarean section is the method of choice and should be given first place in cases of placenta prævia in primiparæ when the cervix is dense and undilated and there is severe hæmorrhage. He has performed 348 abdominal cesarean sections, 12 of which were for placenta prævia. In cases where the hæmorrhage is profuse after the delivery of the placenta, the uterus and vagina should be firmly packed, pituitrin injected, and the fundus held until it shows no tendency to considerable relaxation. Transfusion of carefully tested blood has saved a number of cases.

In accidental hæmorrhage occurring late in pregnancy the indication is immediate cesarean section. Postpartum hæmorrhage may come from the placental site, from lacerations of the cervix or uterus, or from all of these. If the hæmorrhage is profuse, the indications are for immediate removal of the placenta, either by expression or by manual separation with the hand inside the uterus. Ergot or pituitrin in these cases will aid retraction or contraction of the uterine muscles. Pituitrin acts more quickly and forcibly than ergot, through its action is not long sustained. Without waiting for the action of these drugs, every other method should be brought into use, i.e., massage of the fundus, forced ante flexion of the uterus against the symphysis, compression of the fundus with one hand externally against the other hand in the uterus, hot intra-uterine douche (118 to 120°F.) of normal salt solution, bichloride of mercury (1-10,000), tincture of iodine, or acetic acid, two quarts to

four quarts of hot water. In case the douche is not quickly at hand, a pad of cotton gauze saturated with acetic acid and applied freely all over the interior of the uterus has proved successful many times.

Hæmorrhage due to laceration of the cervix cannot be controlled by packing. If large arteries have been torn, packing is a dangerous procedure. Hæmorrhage from laceration of the perineum or vagina may be profuse enough to be dangerous, but being accessible, should be controlled by ligatures and sutures which repair the lacerations.

There is a form of postpartum hæmorrhage which appears in a few cases at about the tenth or twelfth day; this should be treated by rest in bed, an ice-bag over the lower abdomen and one ccm. of pituitrin three times a day. Late postpartum hæmorrhage occurring two or three weeks after delivery should be treated after the same plan advised for incomplete abortion.

Ayres, D. R.: Some Observations on the After-Results of the Interposition Operation. *Am. J. Obst.*, N. Y., 1917, lxxvi, 451.

The after-results of 37 interposition operations are reported. Of these, 21 presented some ill effects. Nine cases of cystitis occurred, due to colon bacillus and staphylococcus infections. Anatomical conditions probably contributed largely to the condition, as the floor of the bladder was much distorted by the uterus, the trigone pushed up and large pockets formed on either side of the trigone.

Incontinence, prolapsus of the fundus, dragging down the floor of the bladder, return of the prolapsus, and dyspareunia were other undesirable sequelæ.

Anatomically, the results were much more favorable, as 30 out of the 37 could be said to have perfect cure of rectocele, cystocele, and prolapse.

Contra-indications for the operation are the child-bearing age, prolapse of the third degree and fibroids causing hæmorrhage. It is indicated in the lesser degrees of prolapse with cystocele. In these cases, large uteri should be reduced in size and an effort made to keep the floor of the bladder level. In cases of incontinence, the sphincter of the bladder should be strengthened. Cystoscopic examination and careful urinalysis should be done before and after operation.

W. L. BROWN.

ADNEXAL AND PERIUTERINE CONDITIONS

Gomez, R. S.: Chronic Appendicitis and Sclero-cystic Ovaritis (*Appendicitis cronica y ovaritis escleroquistica*). *Rev. argent. de obst. y ginec.*, Buenos Aires, 1917, i, 157.

In Gomez' opinion chronic appendicitis in women is usually accompanied by cystic degeneration of the ovaries. The symptomatology due to the ovaritis is much the same as the symptomatology of chronic appendicitis. Operation should be aimed toward the appendix and the ovaries, distinguishing the two

different conditions involved in the ovaritis. If the cysts are small and numerous, laparotomy should be practiced. If the cysts are large and numerous, or there are hematomas or degeneration of the corpora lutea, conical resection of from one-third to two-thirds of the gland, according to the case, should be done. Uterine lesions if concurrent should be remedied.

If the lesion is bilateral or seated in the left ovary; or if there are uterine lesions to be remedied, median laparotomy should be done.

The foregoing is the method followed in the author's clinic when a chronic appendicitis is operated upon and the condition of the ovaries is previously determined so that it is known whether the right or left is to be attacked. It is the outcome of the failure to obtain improvement in many cases of chronic appendicitis previously operated upon without taking into account the condition of the ovaries.

W. A. BRENNAN.

EXTERNAL GENITALIA

Loumeau: Vesicovaginal Fistula and Calculous Cystitis (*Fistule vésico-vaginale et cystite calculuse*). *Gaz. hebdomadaire de médecine*, Bordeaux, 1917, xxxviii, 62.

Loumeau refers to a case in which a woman was attacked by an intense calculous cystitis which complicated an old vesicovaginal fistula which had resulted after her first labor twenty-three years before. Until recently the only symptom of importance had been a painless incontinence of urine, evacuation always being effected through the vagina and not through the urethra. After an incision in the vaginal wall beneath the fistula the calculus was extracted; but attempts made to treat the fistula were without success, and the urinary incontinence persisted. The author thinks the case interesting from the pathological point of view, because vaginal fistulization of the bladder, though usually efficacious against vesical infection, has not in this case prevented the production of a very

intense calculous cystitis twenty-three years after the production of the fistula.

W. A. BRENNAN.

MISCELLANEOUS

Gentili, A.: Spontaneous Closure of Ureteral Fistula Consecutive to Gynecological Interventions (*Sulla guarigione spontanea delle fistole ureterali consecutive ad interventi ginecologici*). *Ann. di ostet. e ginec.*, 1917, xxxix, 1.

The idea that ureteral fistulae consecutive to gynecological operation frequently recover spontaneously has resulted from the fact that several of these cases have been reported. Sfameni in 1905 made a critical examination of such reported cases and concluded that in a large number of them it was a fistula of the Malphigi-Gartner conduit. Before pronouncing positively the existence of an ureteral fistula he thinks it is necessary to examine the case carefully under all aspects.

In a case reported in a woman of 32 years the author performed subtotal hysteromyomectomy and bilateral adnexectomy by the abdominal route for uterine fibroma largely intraligamentous with parovarian cysts developed in the thickness of the right broad ligament and a left peri-ovarian salpingitis. The postoperative course was regular until the fifteenth day when there was a rise in temperature due to a seropurulent collection in the left half of the pelvis and the discharge of a thin fluid through the vagina. By the twenty-fifth day the discharge had lost the character of a thin pus and assumed that of an urinous fluid. The diversity between the fluids suggested a fistula of the Malphigi-Gartner canal but the diagnosis was abandoned after ureteral catheterization. This showed it to be a left ureteral fistula which had opened a passage through the wound of the fornix. While considering the question of a new intervention after nearly two months of urinary loss, there were clinical signs of a tendency to a spontaneous closure of the fistula. It cured without intervention within another month.

W. A. BRENNAN.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Orfila, I. P.: **Protracted Ectopic Pregnancy with Putrefaction of the Fœtus Retained in the Abdomen** (Gestación ectópica prolongada con putrefacción del huevo retenido en el abdomen más de 9 meses). *Rev. argent. de obst. y ginec.*, Buenos Aires, 1917, i, 217.

The case reported by Orfila occurred in a negress aged 25 years, with five previous normal labors. She became pregnant about the end of August, 1915, and her labor was due in May, 1916. Labor did not occur at this time but toward the end of June she was seized with violent pain and confined to bed. Her condition was then diagnosed as peritonitis. Later in July serosanguineous fluid escaped *per vaginam*. The woman was not seen by the author until March, 1917. She then gave the impression of a patient with tuberculous peritonitis with abundant ascites. A small fissure was observed in the umbilical prominence which gave issue to a seropurulent fluid. This was dilated and three liters of dark seropurulent fluid withdrawn. The symptoms persisted, viz., a voluminous abdominal tumor, amenorrhœa of 20 months, a serosanguinary secretion and fever; these raised difficulties of diagnosis between bilateral ovarian tumor with a twisted pedicle and infection or a pregnancy co-existing with an infected ovarian cyst. The author finally diagnosed with reservation an ectopic pregnancy at term with infection of the fœtus.

Infra-umbilical median laparotomy was done April, 1917. On opening the abdomen and incising the muscular tissues, the fœtus fully developed and in an advanced state of putrefaction was found and extracted. The cord was adherent to the fœtal head. The placenta was globular and adherent to the left iliac fossa and was retracted upon itself. To prevent hæmorrhage, the aorta was compressed and the placenta then freed. Hæmorrhage was slight. The uterus was found about normal in size and showing no signs of rupture. To the right of the uterus a conglomerate mass with thick adhesions was found consisting of the apparently normal right tube and ovary. The circumstances therefore pointed to a left tubal or left tubo-abdominal pregnancy. A posterior colpotomy was done, and a liter of serum administered per rectum and abdominovaginal drains inserted. Suppuration ceased after three weeks.

Five weeks after operation the patient was in excellent condition. Examination on leaving the hospital showed the uterus in anteversoflexion, normal in size and consistency, but with a slight limitation in its movements.

The fœtus was feminine and weighed 2180 grams. The placenta weighed 800 grams. The length of

the fœtus, 54 cm., the weight of the placenta, the condition of ossification of the inferior epiphyses of the femur, and the abundance of hair developed, led the author to believe that it was a fœtus of more than 9 months, and that this was a case of prolonged ectopic gestation. The history brings him to the conclusion that the fœtus lived 10 months in the abdominal cavity and that it remained dead in the cavity 9½ months.

W. A. BRENNAN.

Ladinski, L. J.: **Ectopic Gestation: Diagnosis and Treatment.** *J. Am. M. Ass.*, 1917, lxi, 633.

The author calls attention to the signs and symptoms of ectopic gestation and remarks that the diagnosis is usually quite easy to make, but not infrequently a positive diagnosis is impossible. A correct history, together with the exclusion of intra-uterine pregnancy, calls for a positive diagnosis. The author lays down this simple rule: "Think of ectopic gestation in every patient who has had an amenorrhœa followed by irregular bleeding and pain on one side." Diagnosis after rupture has taken place is very much easier than before this accident has occurred.

In the author's experience the following conditions have simulated ruptured ectopic gestation so closely that a wrong diagnosis was made:

1. Spontaneous amputation of a twisted pedicle of an ovarian cyst.
2. Torsion of the tube, with cyst of fimbriated extremity.
3. Perforation of graafian follicle.
4. Rupture of corpus luteum cyst.

In the author's opinion, the only rational treatment for ectopic gestation, unruptured or ruptured, is immediate operation. In his series of 280 cases there were 4 deaths, 3 of which could be directly attributed to delay in operation. Hæmorrhage from a ruptured tube should be treated just as hæmorrhage from any other source, regardless of the severity of the shock. The tendency to secondary shock becomes more marked as the interval between rupture and operation is prolonged.

The abdominal route is invariably employed. Speed is essential, though one should not sacrifice careful surgery for the sake of speed. Blood clots should be wiped out with moist sponges before closing the abdomen. Drainage is unnecessary. In cases of extreme shock saline infusion should be given simultaneously with the opening of the abdomen.

H. B. MATTHEWS.

Snyder, J. W.: **Eclampsia and Lumbar Puncture.** *J. Am. M. Ass.*, 1917, lxi, 1074.

Snyder reports a case of lumbar puncture for the relief of convulsions in eclampsia. The woman,

aged 25, a primipara, had had seventeen convulsions in about twenty-seven hours and in spite of a rapid delivery and the usual treatment for eclampsia, the patient progressively grew worse. The breathing became shallow and irregular, with considerable oedema of the lungs. The face was cyanotic. Temperature was 106, respiration 34, pulse 140 and weak and irregular.

As a last resort, the author made a lumbar puncture and drew off 2 drams of clear spinal fluid. There was little, if any, increase in intra-spinal pressure as the fluid escaped very slowly. The condition of the patient immediately improved. Consciousness was restored within a few hours. The temperature reached normal on the third day. Administration of sodium bicarbonate and glucose by the rectum were continued for several days. Convalescence was uninterrupted and the patient left the hospital on the thirteenth day postpartum in good condition, except for some necrosis at the site of puncture.

The author strongly recommends this procedure for the control of convulsions occurring in eclampsia.

H. B. MATTHEWS.

Young, J. R.: Abdominal Cesarean Section; Indications, Technique; Case Reports. *Virg. M. Semi-Month.*, 1917, xiii, 244.

Young discusses the operation of cesarean section under the following headings: (1) the scope of the operation according to recent opinion; (2) results which follow more extensive use of the operation; (3) the technique of operation from a surgical standpoint; (4) brief case reports.

The author's experience is limited to 11 personal cases and 30 cases collected from 12 operators throughout South Carolina. The foetal mortality was 23 per cent, maternal mortality 16 per cent. Excluding those who were dead before operating or were premature, the foetal mortality was 2.7 per cent.

The author's conclusions are as follows:

1. Abdominal cesarean section has an established place in surgical obstetrics. Where absolutely indicated, it should be done early and without a test of labor.

2. The success of the operation will vary inversely with the chance of previous infection.

3. Eclampsia *per se* is not an indication for cesarean section, but any obstetric condition which renders rapid and safe delivery hazardous is an indication for section in eclampsia. If section is to be performed, it should be done early.

4. Placenta prævia and premature separation of a normally implanted placenta do not demand cesarean section, provided the soft parts are prepared for safe delivery.

5. Finally, any obstetric condition which may arise should be an indication for cesarean section if it appears that such an operation offers the best chance for life to both mother and child.

H. B. MATTHEWS.

Truesdell, E. D.: Cesarean Section for Congenital Partial Occlusion of the Vagina. *Bull. Lying-In Hosp. N. Y.*, 1917, xi, 199.

Bony deformity is a much more common indication for delivery through the abdominal wall than deformity of the soft parts. For this reason, the features of the case here presented are of interest.

The patient, aged 19, at the end of her first pregnancy revealed an abnormality of the vagina and was sent to the Lying-In Hospital. Labor had been in progress ten hours. On admission, the vagina was found to be small, conical, and without evidence of internal orifice, its direction upward behind the symphysis, and the child's head in the hollow of the sacrum. On doing an abdominal cesarean section, no suggestion of an internal os could be found. The operation and convalescence were uneventful.

Repeated thorough vaginal examinations during the next six months showed the vagina to be a blind pouch or pocket two and one-half inches deep, lined by normal-looking mucosa. The external urinary meatus was of keyhole shape, the anterior portion resembling the normal urinary meatus, the posterior presenting a crescentic lip or margin resembling in contour half of a rudimentary external os uteri. A catheter introduced into either orifice seemed to enter the bladder, and withdrew clear urine. The posterior or cervical portion was practically situated within the ostium vaginae, while a finger passed upward into the vagina behind this could feel a slender rounded structure suggesting a long and slender cervix uteri.

Examination during the menstrual flow showed the blood oozing from a minute hole, too small to admit the point of an ordinary probe, situated in the middle of the anterior vaginal wall. A catheter passed at this time over the cervix-like lip penetrated into the bladder and withdrew clear urine.

The patient's menses had begun at fourteen years. There had evidently been no hematometra and no other menstrual abnormality. There was no history of injury such as might have resulted in scar-tissue deformity.

C. D. HOLMES.

Rosensohn, M.: Case of Placenta Prævia in Twin Pregnancy. *Bull. Lying-In Hosp. N. Y.*, 1917, xi, 200.

The patient, aged 37, III-para, came to the hospital with the diagnosis of placenta prævia, though her former labors had been normal. Of the meager history obtained, the only prominent feature was the hæmorrhage which had occurred with the onset of labor several hours earlier. On examination, she was found somewhat anæmic, with heart and lungs negative. Abdominal examination showed a fundus four fingers below the ensiform. Vaginal examination under the usual precautions showed a marginal placenta prævia, but in spite of the utmost care, the resulting hæmorrhage was so severe that the hand was kept in the vagina and cervix as a tampon

while the patient was being transferred to the delivery room. Here hasty version and rapid delivery were made with the birth of a child weighing three thousand grams. The placenta followed immediately with considerable bleeding. The second child, born by a version and a breech extraction, weighed two thousand four hundred and eighty grams. The placenta, too, was easily extracted but with profuse hemorrhage. The uterine cavity was packed with iodoform gauze and the patient returned to the ward in good condition. Her convalescence was normal, temperature never higher than 99.4° and she was discharged on the twelfth day with her two babies in good condition.

C. D. HOLMES.

Plass, E. D.: Placental Transmission; Total Creatinine in Plasma, Whole Blood and Corpuscles of Mother and Fetus. *Bull. Johns Hopkins Hosp.*, 1917, xxviii, 297.

In a recent study of the placental transmission of creatinine and creatine, the author found that the maternal and foetal plasmas or sera have the same concentrations as these two substances, but that the whole blood shows the same definite relationship only in the preformed creatinine, whereas the total creatinine and subtracted creatine values are higher in the foetal blood.

Acting upon the suggestion that the values obtained for total creatinine in whole blood by Folin's method were probably too high, Plass made subsequent observations which indicated that this criticism was valid; and by the use of the acetic acid precipitation method, lately suggested, he obtained consistently lower results. The higher values found when the Folin procedure was employed are probably explained by the presence in the blood of some substance, not creatine, which, when heated with picric acid, produced a compound which gave a color development on alkalization similar to that produced by creatinine.

In continuing the previous work, the author made a number of determinations of total creatinine on plasmas and whole blood by means of the new procedure. The preformed creatinine was not determined because the previous analyses had indicated that if the blood was unhemolyzed, the two samples gave approximately the same results. In view of the reported lower creatine content of foetal tissues it seemed probable to the author that the blood-cells would show a comparable difference, but such, he states, was not the case.

From his study, in which previous work on the total creatinine content of maternal and foetal plasma and whole blood was repeated, a different analytical procedure being employed, the author concluded that there was no definite relationship existing between the maternal and foetal whole blood in a given case, but the plasma values in both series of his experiments agreed closely, indicating to him a direct diffusion of the creatinine bodies through the placenta.

In the parturient woman and in the new-born child there was usually an increased ability of the red blood-cells to store creatine. In spite of the reported lower creatine content of foetal tissues, the maternal corpuscles did not always show a higher creatine content than the foetal cells.

GEORGE E. BEILBY.

Guazon, P.: A Case of Advanced Pregnancy in the Broad Ligament. *Philippine J. Sc.*, 1917, xii, 33.

Guazon reports a case of advanced pregnancy in the broad ligament in a para-XI, aged 38, who did not show any of the signs of pregnancy, except the cessation of menstruation. Her last child was 5 years old. Five months before the author saw the case, the woman began to have paroxysmal pains across the lower abdomen, usually at night. Later she noticed a tumor mass in the lower abdomen which gradually increased in size and was painful at times. She began to grow stouter and the breasts began to enlarge. A diagnosis of ovarian cyst, or some kind of ovarian tumor, was made and operation advised.

Upon opening the abdominal cavity the tumor mass was found to occupy the entire lower abdomen, extending more toward the left iliac region. A cannula was introduced, but only a small amount of pure dark blood obtained. Upon opening the mass a dead fetus of about 5 months was found. The placenta was shelled out entirely by the fingers.

The author believes this was a case of tubo-ovarian pregnancy at the beginning, which became intraligamentous later, following a rupture into the folds of the broad ligament. Two important points are brought out relative to the above case:

1. The treatment of advanced ectopic pregnancy should consist in immediate operation as soon as the diagnosis can be made.

2. The placenta should be removed at the primary operation, provided it can be done without causing a fatal hemorrhage.

H. B. MATTHEWS.

Block, F. B.: Dermoid Cyst of the Ovary Complicating Pregnancy. *Interst. M. J.*, 1917, xxiv, 796.

Dermoid cyst of the ovary complicating pregnancy is by no means common. This case is reported because it proves that the tumor may be removed early without hindering progress of the pregnancy to a normal termination.

The patient, a nullipara, aged 24, consulted the author because of dysmenorrhoea and dyspareunia. She had been married one year, her menstrual history was negative, with no pregnancies. Examination disclosed a retroverted uterus and a tumor the size of a peach on the right side, diagnosed as prolapsed cystic ovary. Later she became pregnant, and again consulted the author about four months after conception because of pain in the right lower abdomen, increasing tenderness, and nausea. These symptoms persisted and a few days later the tumor, twisted once on its pedicle,

was gently removed. The patient was given morphine for two days following the operation, but this was discontinued because of excessive nausea. Convalescence was uneventful, and she was delivered of a normal child at term.

The author refers to cases previously reported. Barrett reviewed 114 cases, and strongly recommends the early removal of the tumor. If allowed to persist too long in pregnancy, hysterotomy may be necessary in order to give sufficient exposure to permit removal of the ovarian tumor. Doyle reports a case where the tumor was removed at the fifth month, and the patient kept under the influence of morphine for five days to lessen uterine contractions. Lewis in a recent article gives some interesting statistics relative to ovarian tumors complicating pregnancy. He says 68 per cent are cystadenomata, 23 per cent dermoids, 2 per cent fibroids and 5 per cent malignant tumors. Torsion occurs in 80 per cent of the cystic tumors.

The author concludes, in view of these facts, that the tumor should be removed early in pregnancy, unless discovered late in pregnancy or so situated that the tumor does not obstruct the outlet.

W. L. BROWN.

Titus, R. S.: Bleeding in Pregnancy. *Boston M. & S. J.*, 1917, LXXVII, 413.

Titus insists that vaginal bleeding in pregnancy be immediately investigated, since the safety of the patient depends upon an early and accurate diagnosis. To facilitate discussion, the significance of bleeding is considered in relation to the first, second, and last three months of pregnancy.

While miscarriage is by far the most frequent cause of hemorrhage in the first period, the necessity of ruling out ectopic pregnancy is emphasized. If serious doubt exists as to diagnosis the author prefers to explore the abdomen by laparotomy. If rupture has occurred extreme cases are given time to recover from shock. The vaginal route he declares unsafe. Curettage is recommended to control bleeding due to incomplete and inevitable abortion. Complete and septic abortions are treated conservatively unless there is bleeding, when a finger curettage is done.

Early carcinoma of the cervix is treated as if pregnancy did not exist. In advanced carcinoma pregnancy is allowed to progress and is terminated by cesarean section. When hydatid mole is diagnosed, preference is given to vaginal section as the method of emptying the uterus, especially if immediate emptying is necessary.

The treatment of placenta prævia is adapted to the individual case. Hospital facilities are imperative. Accouchement forcé is discarded in treating primipara; abdominal cesarean section is resorted to beyond the seventh month with either central or partial placental attachment when the cervix is undilated and bleeding is active. The same operation is done for multipara with urgent symptoms. If dilatation of the cervix has begun, some

method of vaginal delivery is attempted, the bag being preferable to the Braxton Hicks method. Abdominal cesarean section is considered the logical treatment of primipara with ablatio placentæ. If a primipara is in labor, the condition of the cervix is the deciding factor, as in a multipara, as to the choice of the method of vaginal delivery.

W. H. CARY.

Harrar, J. A.: Accidental Hemorrhage: Two Hundred and Fifty-Four Cases in 100,000 Confinements at the New York Lying-In Hospital. *Bull. Lying-In Hosp. N. Y.*, 1917, XI, 151.

Among the 100,000 confinements in the New York Lying-In Hospital premature separation of the placenta took place in 254 cases. The incidence of this complication was noted in the ward service once in every 175 confinements, whereas in the outdoor department which more nearly represents the conditions in ordinary practice, it occurred once in 1,085 confinements. The diagnosis of accidental hemorrhage is made only when the symptoms are severe enough to require treatment. It is interesting to observe that the accident occurred twice as frequently in multipara as in primipara. In the 152 instances of marked hydramnios, premature separation of the placenta occurred but three times; four times in 1,078 cases of twins; twice in 20 cases of triplets; six times in 650 cases of toxæmia of the eclamptic type. In five instances there was evidence of antenatal infection with elevation of temperature and a foul odor of the uterine contents when delivered. External trauma was a feature in 15 cases, fibroid in 3, and a short cord in 2.

Twenty-two deaths occurred in the 254 cases, a maternal mortality of 8.66 per cent. The mortality was considerably higher in the concealed hemorrhage cases, amounting to 25 per cent. No matter what the type of cases, the amount of placental separation, or the method of delivery, with certain reservations, the same conditions apply as in placenta prævia, those who lose much blood die; and those whose blood loss is conserved do not die. There were 133 stillbirths, a fetal mortality of 50.8 per cent in the 262 babies born. Thirty infants died in the first ten days, making a total fetal and infantile mortality of 62.2 per cent. In the concealed hemorrhage group, the only child that survived was delivered by cesarean section.

Of these 254 cases of accidental hemorrhage, 68 delivered themselves spontaneously after simple rupture of the membranes, with two deaths resulting, both due to infection; 27 spontaneously after vaginal pack, with no deaths; 8 spontaneously after the use of a Voorhees bag, with one immediate death due to hemorrhage and eclampsia. Version was performed 81 times with ten maternal deaths. It was done 14 times after cervicovaginal packing, 22 times after manual dilatation of the cervix and 20 as part of an accouchement forcé. Breech extraction was done 19 times. Vaginal cesarean

section was done 5 times with one death. Abdominal cesarean section was done 7 times with no maternal death. The highest mortality occurred in those cases in which version was done after forcible or instrumental dilatation of the cervix.

In the opinion of the author the following indications would be proper in the treatment of accidental hemorrhage:

The progression of spontaneous delivery when the patient in the first or second stage of labor begins to bleed slightly with no other symptoms.

Rupture of the membranes, after the cervix is dilated to three fingers or more: (1) when the patient in the first or second stage begins to bleed moderately or profusely; (2) if with slight bleeding labor pains subside; (3) if with slight external bleeding symptoms develop of concealed hemorrhage.

Cervicovaginal packing with two per cent iodoform gauze: (1) in a case of moderate hemorrhage with cervix closed or dilated less than three fingers; (2) if rupture of membranes fails to institute strong pains; (3) if bleeding continues after rupture of the membranes; pack for four to six hours to hasten dilatation of cervix and to control bleeding by pressure on uterine vessels.

Forceps to hasten labor in the second stage if bleeding continues, or if the fetal heart shows signs of danger impending to the child.

Version only in cases with cervix fully dilated, with head above brim and uterus not tonic. The Braxton Hicks version is not of value as in placenta previa.

Manual dilatation of the cervix, which is generally dangerous and only to be employed to reach out the remaining rim of a fairly well-dilated cervix before proceeding with version, but never employed in the form of an accouchement forcé in a cervix of three fingers' dilatation or less.

Cesarean section, in a case of concealed hemorrhage with closed cervix, the child either dead or alive; especially in the cataclysmic disruptive cases occurring before the onset of labor.

Hysterectomy only in cases of accompanying rupture of the uterus.

Postpartum packing of the uterus to control further hemorrhage after delivery in every case of accidental hemorrhage with symptoms pronounced enough to clinically identify it as such.

In brief, the author recommends, in the treatment of accidental hemorrhage, rupture of the membranes in the very mild cases, rupture of the membranes and the use of the cervicovaginal packing in the more severe cases, reserving abdominal cesarean section for grave concealed hemorrhage cases with closed cervix, and doing a hysterectomy only when there is accompanying partial or complete rupture of the uterus.

C. D. HOLMES.

Allen, E. M.: Coincident Pregnancy and Tabes Dorsalis. *J. Am. M. Ass.*, 1917, lxi, 979.

The patient, aged 37, entered the Los Angeles County Hospital January 14, 1917, seven months

pregnant; she complained of difficulty in walking for the previous three months, and also of difficulty in descending stairs and in balancing herself while standing erect. She had suffered from shooting pains in the legs and thighs rather frequently for two years previous to her admission to the hospital. These were diagnosed as rheumatism by her attending physician, but were knife-like in severity. The diagnosis of locomotor ataxia was made on the basis of the history and the physical findings, which included Argyll-Robertson pupils, absent knee-jerks, the Romberg sign, an ataxic gait and a positive Wassermann test both of the blood and the spinal fluid.

She had one child, born July 3, 1914. Since the first child she had had two miscarriages at approximately three months each. These were spontaneous and painless, and did not follow a fall or other traumatism. The first labor was short and unattended by severe pain.

March 6 the patient was examined. The perineum bulged slightly. The cervix was soft and there was approximately $1\frac{1}{2}$ inches dilatation. The fetal heart rate was 146, with the tones of good quality. The following day the patient had irregular uterine contractions but no pain.

March 8 the uterine contractions were of much less force. A rectal examination showed no increase in the original amount of dilatation. The head was very movable. The fetal heart tones were good and the rate 152. A rectal examination March 9 showed no further increase in cervical dilatation and no easily palpable uterine contractions. The fetal heart tones were 156. At 3 p.m. 5 grains of quinine were given with no painful effect following, though at 4:30 p.m. dilatation was nearly complete. Five-tenths ccm. of pituitary solution were given hypodermically at 6 p.m. After approximately fifteen minutes pains began and a seven-pound boy, 24 inches in length, was born spontaneously at 7 p.m. The pains were probably two-thirds as severe as ordinary labor pains. No anesthetic was used. The placenta delivered spontaneously twenty minutes later.

EDWARD L. CORNELL.

Stroponi, L.: Bilateral Ovariectomy in Pregnancy, Labor at Term (Ovariectomia bilaterale in gravidanza, parto a termine). *Ann. di ostet. e ginec.*, 1917, xxxviii, 493.

The question of removing both ovaries from a pregnant woman without interrupting the pregnancy depends strictly on two more general and more important questions: (1) the possibility of intervening by laparotomy directly on the genital organs of a pregnant woman without danger to the continuation of the pregnancy; (2) the possibility of completely suppressing the internal secretion of the ovary during pregnancy without ill effects to the woman either during the labor or puerperium.

To the first question clinical experience has largely replied in the affirmative. Numerous

cases of myoma and ovarian cyst have been operated upon during pregnancy without apparent prejudice to its continuation to term. The second question is more complicated and as yet remains unsolved. There is still a great deal of obscurity regarding the endocrine activity of the ovary and the exact functions of the corpus luteum, etc., as regards the general organism and the gravid state.

A few authors have reported cases of bilateral ovariectomy without interruption of pregnancy. Much more numerous are the cases reported in which following castration there was an abrupt termination of the pregnancy; and very probably there are many unpublished cases. It appears, however, that in many cases of uninterrupted pregnancy after a bilateral ovariectomy some portion of ovarian tissue was left behind which possibly contained corpora lutea.

The author reports a case of bilateral ovariectomy for a malignant ovarian tumor in a woman of 22 years. The woman was in the fourth month of pregnancy. A tumor the size of a fetal head at term could be felt in the vicinity of the left tube. Nothing special was noted on the right adnexal site. The case was diagnosed as a dermoid cyst of the left ovary and intervention was recommended and accepted. On opening the abdominal cavity both ovaries were found tumorous and hard and apparently malignant; they were removed. The postoperative course was completely normal.

Microscopic examination of the removed tumor showed the complete absence of any trace of normal ovarian tissue in either ovary. The tumors were fibrous and diagnosed as luteic sarcoma.

During the interval between operation and term time the patient, otherwise well, exhibited phenomena which could be interpreted as well-known signs of ovarian insufficiency, and ovarian extract was prescribed. The labor occurred at term and was quite normal in all respects. The child was normal. However, there was evidence of a deficiency in lactation at first which became abundant later on.

The author discusses the case and thinks from this clinical experience that it is permissible to conclude that removal of both ovaries from a pregnant woman at least after the fourth month of pregnancy, does not necessarily result in an interruption of the pregnancy. He also draws attention to the fact that the mammary secretion is independent of the ovarian glandular secretion. This latter fact has long been known experimentally.

W. A. BRENNAN.

Cirio, C. R.: Pregnancy at Term After the Schauta-Wertheim Operation (Solere un caso de embarazo llegado a término despues de la operacion de Schauta-Wertheim). *Rev. argent. de obst. y ginec.*, Buenos Aires, 1917, I, 211.

The patient in the case reported by Cirio was a woman aged 36 years who had a Schauta-Wertheim operation for prolapse in 1910. Both tubes were ligatured with catgut and sectioned at a point con-

tiguous to their interstitial part. The vesical peritoneum was sutured to the posterior face of the uterine isthmus and the edges of the longitudinal incision of the vagina were united over the anterior face of the body of the uterus. The woman became pregnant in 1914 and the pregnancy went to term. Cæsarean operation was done; but Porro's method could not be applied owing to the fixation of the uterus. The obstetrician therefore made a partial amputation of the uterine wall and a peritoneal suturing, isolating the inferior part of the uterine incision in such a way as to realize a utero-abdominal fistula. The pregnancy developed almost entirely in the vicinity of the uterine posterior wall. The woman recovered and the child was in good condition; the fistula closed up.

The author discusses three points in connection with this case:

1. Is section of both tubes after previous ligation and suture of the vesical peritoneum to the posterior face of the uterine isthmus sufficient to effect sterility? The author thinks it is; however, in the case under reference the peritoneal suture must have left a small peritoneal opening which allowed the interstitial part of the tube to be in communication with the ovary and contiguous parts; this is the only way in which the fecundation can be explained.

2. In a uterus whose condition is such as this, can a pregnancy continue after beginning; and if so, what is the conduct to follow? The termination of the case reported answers the first query. The author discusses the second part and concludes that the course followed in this case, viz., abdominal cæsarean section, was the correct and only one to follow.

3. Under the conditions, if pregnancy is diagnosed with a viable fetus, ought it be allowed to progress to term? The author thinks that in the case of a woman who had no children, the pregnancy might be permitted to go on, but in the contrary case, abortion should be induced.

W. A. BRENNAN.

LABOR AND ITS COMPLICATIONS

Mazzini, E.: Treatment of Uterine Ruptures During Labor by the Boero Method (Tratamiento de las rupturas uterinas durante el parto por el procedimiento Boero). *Semana méd.*, 1917, XXIV, 85.

Mazzini publishes 5 cases of uterine rupture occurring in the course of labor and treated by the Boero method. He claims 80 per cent of recoveries.

The method is described in full detail and its principal features may be thus given in résumé: Fœtal extraction is done through the vagina, except in case it has passed into the abdominal cavity, which is infrequent; in execution the left hand, carried as far as the uterine neck, ascends delicately by the anterior or posterior wall of the lower segment and reaches the edge of the rupture. With the thumb and index finger the superior margin of the tear is seized about the middle line of the corpus and pulled down towards the vagina, aid being given

by pressure of the right hand on the uterine fundus through the abdomen. The maneuver is carried out in such a manner that the external or peritoneal face of the upper lip of the tear is behind the internal or mucous face of the lower lip of the tear, thus making the superior behind the inferior when the tear is on the anterior uterine wall and in front of the inferior when the tear is on the posterior wall.

The fingers are then replaced by 2 four-toothed forceps which remain permanently, and a drainage tube is inserted. The lower segment is tamponed with iodiform gauze. A permanent sound is left in the vagina. After 72 hours the tampon drain and forceps are carefully withdrawn and a vaginal irrigation done.

W. A. BRENNAN.

Barbour, H. G.: Tyramin as an Adjunct to Morphine in Labor. *J. Am. M. Ass.*, 1917, lxi, 882.

The employment of morphine in labor in recent years has become frequent, probably owing to "twilight sleep" propaganda. Used in this connection morphine exhibits three important effects, the first desirable, the other two untoward; namely, analgesia, respiratory depression in the child, and delay of labor.

Since Hatcher pointed out the almost complete lack of theoretical justification for the employment of scopolamin in this connection seven years ago, little if any new evidence has been introduced in its favor, nor has knowledge of its obscure pharmacology been very appreciably increased. This is due in part to the varied manifestations of scopolamin action, and to the unstable character of the alkaloid.

The author states that experimental work does not make it plain that morphine depression of respiration is constantly affected by its combination with scopolamin. In some instances the depression was delayed or preceded by acceleration. On the uterus itself ordinary doses of morphine in anesthetized animals show no effect; in unanesthetized animals by cerebral effect small doses of morphine tend to inhibit the rhythmic action of the uterus.

In this connection Bry, Dale, and Dixon have pointed out that tyramin (para-hydroxy-phenyl-ethyl-amin hydrochlorid) has two desired effects, respiratory and uterine stimulation. Tyramin, the active principle of ergot, is derived by bacterial action on tyrosin containing proteins. Cobey studied the effect of this drug on morphine narcosis in mice and concluded that any influence which it might have on this narcosis was probably negligible. Maurer was able to demonstrate very clearly an antagonism between the action of morphine and tyramin which was best exhibited when they were administered in the ratio of approximately three parts of tyramin to one of morphine. Most significant was the fact that the respiratory action of morphine often remained in abeyance during a period when marked analgesia was present.

The author recommends the use of tyramin forty to fifty mg. and morphine sixteen mg. sim-

ultaneously. This is given hypodermatically, in the absence of contra-indications, when discomfort becomes marked in the first stage of labor. The respiratory rate of the mother becomes slightly increased rather than decreased and usually remains somewhat accelerated throughout. The condition of the child has been quite satisfactory, no tendency to asphyxia having been observed.

In every case the frequency of the uterine contractions has been increased within five minutes after the injection and this augmentation maintained throughout. The increase has usually been from five minute intervals to intervals of about two minutes, with an augmentation temporarily, at least, in the strength of individual contractions. Forty mg. of tyramin produce a temporary rise in blood-pressure usually amounting to twenty to twenty-five mm.; this seems to be negligible in normal cases but should be borne in mind and followed closely.

C. D. HOLMES.

PUERPERIUM AND ITS COMPLICATIONS

Barnard, E. P.: Retained Placenta. *Am. J. Obst.*, N. Y., 1917, lxxvi, 477.

Retained placenta, a completely separated placenta which remains in the uterus, may be due to inefficient uterine contractions or tetanic spasm of the contraction ring. Too vigorous efforts to express it may dislodge clots and thus result in sharp hæmorrhage. The author advises gentle Credé expression when the placenta does not separate and deliver itself within 30 to 45 minutes. If the placenta lies in the grasp of a tight contraction ring, the uterus should be let alone until it relaxes and releases the placenta, then the placenta should be expressed by Credé.

Introduction of the hand into the uterine cavity to remove retained bits of placenta often leads to infection and death. Expectant treatment is advised if the retained part is not large, or if there is not serious hæmorrhage.

In summary, first, it should be determined whether the placenta has separated. Then gentle manipulation should be used to stimulate the uterus to expel the placenta. If this fails, gentle Credé expression should be employed.

W. L. BROWN.

Reynolds, C. B.: Retained Adherent Placenta. *Am. J. Obst.*, N. Y., 1917, lxxvi, 479.

If the cellular or spongy layer of the decidua is absent or becomes atrophied, a preponderance of connective tissue results and the placenta may adhere partially or completely to the uterus. This occurs about once in every 500 cases. Gonorrhœa and low grade endometritis are considered the most common causes of this condition.

In a completely adherent placenta, usually there is no bleeding from the placental site, but if partially adherent, the bleeding is usually profuse and should be treated at once by manipulation and pressure over the fundus of the uterus.

In severe hemorrhage the gloved hand should be introduced into the uterus under strict aseptic conditions, and the placenta or remnants removed, the external hand being used as a guide and to exert counter-pressure.

The dangers in cases of retained adherent placenta are: (1) inversion of the uterus in manipulating the uterus, (2) hemorrhage in the partially detached variety, and (3) sepsis.

Morbidity and mortality from sepsis can be lowered by careful preparation for labor, rigid cleanliness, and infrequent internal examinations.

W. L. BROWN.

MISCELLANEOUS

Stein, A.: Influence of Labor on the Brain Development of the Child. *J. Am. M. Ass.*, 1917, LIX, 134.

The author considers the question of preventable traumatism to the skull and its contents in long protracted labors and instrumental deliveries, with reference to the production of feeble-minded children. In prolonged labor damage may be done to the child's brain by one of three mechanisms: first, direct contusion of the brain substance; second, local congestion and rupture of intracranial vessels by the overriding parietal bones; third, general congestion of the venous system causing capillary hemorrhages of the meninges. In three of the author's cases sufficient damage was done to brain and nerve centers to destroy life. He therefore assumes that unquestionably many infants survive with irreparably damaged brains.

In one series of 5,000 cases of mental defectives, it was found that 134 cases or 2.68 per cent were instrumental deliveries, and 75 cases or 1.5 per cent were prolonged labor deliveries. In another series of 562 cases of mental defectives, difficult or prolonged labor appeared 125 times; in 54 of these no instruments were used. In the records of Dührssen and Kuntzel, among a series of 450 idiot children 4 or .009 per cent were found whose idiocy was attributed to instrumental traumatism and 23 cases to unassisted difficult deliveries.

The author cites the case of a primipara, aged 22, who was in labor three days, giving birth to a feeble-minded child. Dührssen and Kuntzel concluded that unduly prolonged and difficult birth asserted a far more injurious influence on the child's brain than the skilled application of forceps. In

Tissier's neurologic statistics covering a series of 900 cases, among 76 idiotic children, 18 were born asphyxiated following difficult labors and 18 were born after difficult labors without asphyxiation. After a study of 2,180 mentally deficient children, Shuttleworth and Potts concluded that protracted pressure without instrumental interference was a more potent factor in the causation of mental and nervous defects than forceps, and Volland showed in his report that in the same family children born in normal labor were normally constituted, whereas those born after difficult labors became epileptic.

The author cited many other groups of statistics which seemed to indicate the same conclusion, that prolonged and difficult labors exert a more harmful effect upon the mentality of the child than properly applied forceps, and that in the interest of the child protracted births should be judiciously terminated by intervention, since a delay until the fetal heart tones have become weak or inaudible means that irreparable damage has been done to the infant's brain.

An interesting case was reported of a child with congenital spastic paraplegia, who was born asphyxiated after a hard labor. The child was mentally defective and died the first year. The necropsy showed adherence of the pia over both hemispheres and marked symmetrical atrophy of the frontal halves of both hemispheres. The diagnosis was chronic meningo-encephalitis, undoubtedly due to an extensive effusion of blood between the pia and cortex.

The author also cited the statistics of Beach covering a series of 810 cases of idiocy, of which 4.3 per cent were charged to the application of forceps as against 26.6 per cent apparently due to prolonged and difficult labor.

In summary the author concludes: first, that prolonged unassisted labor is responsible for much avoidable harmful compression of the infant's skull; second, that the damage sustained by the child's brain and meninges often affects the intellectual growth; third, that there should be more systematic study and records concerning the connection between obstetric traumatism and nervous diseases; fourth, that the obstetric forceps correctly applied should be used to prevent prolonged labor; and lastly, that the pituitary solution, two to three minims, hastens labor and often eliminates the necessity for the application of forceps.

L. H. HILLS.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY AND URETER

Merritt, E. P.: Stones in the Urinary Tract. *J. So. Car. Med. Ass.*, 1917, xiii, 676.

The diagnosis and management of foreign bodies in the urinary tract are placed upon a scientific basis by the cystoscope, the X-ray, the microscope and tests of the functioning power of the kidneys.

Stones may be lodged in the kidney, ureter, bladder or urethra, or more uncommonly, in the vesicles or prostate. The idea that all stones cause severe pain is erroneous. There is generally more pain from ureteral or bladder stones than from those in the pelvis of the kidney, but, as a rule, all urinary stones give discomfort at some period of their existence.

Symptoms of renal stones include a history of renal colic, pains in kidney region referred to the lumbar region and down the thighs, sometimes continued to the legs, with blood and pus cells in the urine, either microscopic or macroscopic. Usually the roentgen ray will give a shadow of the stone, if it is not purely uratic. If stones are very large, filling the pelvis and calices, the question of removal arises. With this condition the functional capacity of the kidney must be determined.

Symptoms of ureteral stones are pain reflected to the front and back, to the side of the vagina, or to the testicle and side of the penis. If the stone is large enough to block the ureter, pain is augmented. For diagnosis the X-ray and the iron oxide catheter is almost indispensable. If the stone is located the patient should be given morphine and atropamine hypodermically, the ureter dilated to the limit and examination made with a cystoscope. Then about 2 ccm. papaverin sulphate solution is injected below the stone, followed after fifteen minutes by an injection of 1 or 2 ccm. of sterile olive oil. The patient should be put to bed, and a hot sitz bath prescribed. This procedure is not always successful, but is worth a trial before surgery is resorted to.

Symptoms of stone in the bladder vary, but generally there are pains in the bladder region, referred to the testicle and end of the penis. The larger the stone, the more severe are the symptoms. Pain is greater on exertion, and there is frequently a cut-off in the flow of urine accompanied by a biting pain. Generally the stone is readily seen through the cystoscope, or demonstrated by the X-ray.

Stones are seldom lodged in the urethra, but one such case has been observed by the writer. Stones of the prostate and seminal vesicles are more common, giving rise to constant burning and irritation of the deep urethra.

Taylor, G.: A Plea for Caution in the Surgery of Suspected Renal and Ureteric Calculus. *Practitioner*, Lond., 1917, xcix, 151.

The author in a brief clinical report calls attention to the importance of careful study in cases of suspected kidney and ureteral stone, and lays great stress on the importance of using the shadowgraph catheter, with or without pyelography, in all cases in which there is the least doubt about the nature of the shadow obtained by the roentgen ray. Many cases in which the nature and origin of the shadow-producing body has not been definitely determined, and a diagnosis of stone made, have resulted in operation in which no stone was demonstrated.

The author has the courage of his convictions and reports one case in his practice in which he failed to resort to all methods for determining the location of the shadow-producing body, and upon operation found no stone.

A paper of this kind is very timely, and emphasizes the importance of thorough pre-operative study in this group of cases.

H. L. KRETSCHMER.

McWilliams, C. A.: Septic Kidney Infarct from Infected Finger; Nephrectomy. *Med. Rec.*, 1917, xcii, 215.

The patient, 38 years old, was admitted to the dispensary on June 3, 1916, with an abscess on the volar surface of the left index finger occupying almost the whole of the anterior closed space. This was opened and made into a single cavity. Five days later freer drainage of the finger was afforded by lateral incisions. Sixteen days after this the terminal phalanx was found to be bare and necrosed.

Examination on admission to the hospital showed a tender mass on the right side of the abdomen extending from the costal margin to the crest of the ilium, very tender in the costal vertebral angle. The X-ray showed no calculi in the kidney or ureter. Ureteral catheterization the following day showed clear urine coming from each kidney. Examination of the secretion from each kidney showed that the right kidney, probably from irritation, was doing a greater amount of work than the left.

At the time of admission the patient's white blood-cells numbered 14,800 and polymorphonuclears 86 per cent. The temperature was 103° F., and pulse 102. The temperature remained remittent, the highest being 103° F. and the lowest 101° F. before operation. A diagnosis of perinephritic abscess was made because of the tenderness and the lack of evidence on catheterization of the ureters of any pus focus in the kidney. Four days after admission, July 7, 1916, the patient was

operated upon. The fatty kidney capsule was very adherent and, on dissecting it, three abscesses were opened. These were supposed to be in the kidney substance. Nephrectomy was done and drainage provided. Culture of the pus showed the *staphylococcus aureus*, the same organism which had caused the finger infection. A thick layer of fat adherent to the kidney was removed with the kidney. Two of the three abscesses were in this fatty capsule, while the third communicated with an embolic abscess in the kidney cortex. Two rubber drainage tubes containing gauze wicks were placed in the pedicle. For one month after the operation, the patient ran a very puzzling and unexplained temperature. Physical and X-ray examination of the chest showed no complications there. It was six weeks before the sinus closed. Two months after the nephrectomy the whole necrosed terminal phalanx of the index-finger was removed under local anesthesia, 2 per cent novocaine. The patient had been well since leaving the hospital after the first operation and had gained in weight.

In the lateral aspect of the kidney capsule was a goss-sized abscess, the walls being very shaggy and containing broken down pus and blood. The cortex of the kidney showed a well-defined suppurative process about 2 cm. in diameter. In one case the cortex had been broken down and had communicated with the perinephritic abscess. The kidney showed a thickened cortex and the capsule proper stripped off with difficulty; in the gross only one abscess was apparent.

EDWARD L. CORNELL.

Rosenbach: Hypernephroma. *Muenchen med. Wchnschr.*, 1917, No. 4.

Rosenbach of the surgical division of the Potsdam Hospital says that it is only recently that much attention has been paid to perirenal hematoma. Hemorrhage was observed in several instances and accounted for differently. Wunderlich and Lench had exactly described the symptomatology of perirenal hematoma as a triad consisting of early sudden pain in the kidney region, rapid formation of a retroperitoneal tumor followed by signs of internal hemorrhage.

In a case described by Rosenbach, there were typical colic pains in the right kidney region and blood as well as albumin was demonstrated in the urine. Later on under the right costal arch a large intumescence could be distinctly palpated which could be pushed forward from the kidney region. There was a progressively augmenting icterus, and as the tumor was rather nearer the gall-bladder region than that of the kidney, diagnosis could not be made a certainty. A pararectal laparotomy was done. The tumor was situated retroperitoneally and referred to the right kidney. A lumbar incision parallel to the iliac wing was made and joined to the pararectal incision. The inferior pole of the kidney was isolated and the tumor, which was

as large as an infant's head, was detached and removed. Examination showed that the tumor was a hypernephroma. The patient died two months later from pulmonary gangrene.

The author says that in this case two of the recognized symptoms of perirenal hematoma were present but the third sign, internal hemorrhage, was not demonstrated. As regards the hemorrhage from the tumor, it is known that malignant hypernephromata have a tendency to hemorrhage, and that hemorrhagic areas may be found on those of any conspicuous size.

W. A. BRENNAN.

Garcia, A.: Congenital Bilateral Absence of Kidneys in a 140 Millimeter Pig Embryo. *Philippine J. Sc.*, 1917, xi, 191.

A review of the literature on renal malformations and maldevelopments has demonstrated the fact that, while unilateral congenital absence and maldevelopment of kidneys have been frequently recorded in man and the lower animals, bilateral cases, though observed with comparative frequency in embryos, have been reported but once or twice in the human body.

The specimen reported was a female pig embryo, 140 mm. long, from a litter of five apparently perfectly normal specimens of approximately equal size. In external appearance and on examination of the thoracic and abdominal cavities, this specimen appeared normal. Garcia's attention was called to the absence of the kidneys. The genitalia also appeared normal; the ovaries measured 5.5 by 3 mm. The oviducts and uterus were in every respect identical with those of pigs of the same size.

In the urinary apparatus the bladder was well developed, measuring 12 by 4 mm. and ending in a well-formed urachus. The two hypogastric arteries were also well-defined and normally located. The kidneys were absent, and no traces of what might be taken for rudiments of these organs could be found in the neighborhood of their normal position. The two ureters were well developed and their orifices at the trigone were patent. The right ureter, which appeared slightly larger and longer than the left, began from the right interolateral side of the bladder, passed in an upward and lateral direction for about 9 mm., then continued upward in a wavy course over the quadratus lumborum for about 16 mm., and ended in a funnel-shaped expansion which was lost in the retroperitoneal fascia in this region. The left ureter, slightly smaller in diameter than the right, was decidedly shorter and lacked an abdominal portion. Traced from the lower inner side of the bladder, it passed in a lateral direction to the back of the pelvis with a slight concavity upward for a distance of 6.5 mm. and ended in a thin membrane attached to the posterior pelvic wall. Occupying apparently normal positions, the adrenals appeared as two large, more or less pyramidal masses which were about three times as large as those of pig embryos of approximately the same size.

Retroperitoneally, over the right quadratus lumborum and on a level with and lateral to the expanded upper end of the right ureter, a small mass of glandular-like tissue of irregular shape was found. This was removed and imbedded for histological examination. Two similar bodies were seen on the right lateral portion of the posterior abdominal wall, one immediately above and the other to the mesial side of the right ovary; both were removed for embedding. On the left side two similar masses were also seen, one of triangular shape a few millimeters lateral to the left ovary, and the other, oval in shape, immediately below it. No other masses of tissue which might be looked upon as suspicious traces of kidney were seen in this region.

In the present case the pronephros had evidently undergone full development and degeneration, leaving behind only its primary collecting duct from which the two ureters apparently normally developed. That the mesonephros had also undergone its normal course of development and degeneration was evidenced by the presence of distinct mesonephric tubules in the region of the rete ovarii forming the parovarium, the normally formed uterus and oviduct, and the two well-developed ureters, which are all derivatives of the mesonephros.

In the case of the metanephros, the ureter in the right side had apparently developed upward to its normal length, and its upper extremity had started to expand into a funnel-shaped primitive pelvis and to divide into several primary collecting tubules. No evidences could be seen, however, of a blastemal cap accompanying it in this upward growth. The left ureter had apparently become arrested at the brim of the pelvis, becoming entangled there in the retroperitoneal mesenchyma. Whether these ureters were accompanied by blastemal tissue from the nephrogenic cord, which might have undergone complete regression, or not is a question which cannot be fully determined with the present findings.

From the present case the following conclusions may be drawn:

1. In the case of the right ureter the absence of kidney is probably due to a failure of the nephrogenic blastemal cap to appear or to develop, the upper expanded end of this ureter having undergone tubular divisions preparatory to the formation of the medulla of the kidney.

2. The left ureter may have been arrested in its growth cephalad and become entangled with the mesenchyma of the pelvis, thus failing to reach the nephrogenic cord and meeting the blastemal substance which might have existed and undergone regression.

3. From the apparently normal development in general of this specimen as compared with the others of the same litter it is probable that kidneys are not essential for proper growth *intra utero*.

4. That the adrenals are generally larger in renal absence, the report made by Coen and others, is also confirmed in this specimen. J. D. BARNEY.

Stevens, A. R.: *Diagnosis of Surgical Lesions of the Kidney and Ureter*. N. Y. M. J., 1917, vol. 105.

Stevens' article is a very timely one, and the author calls attention to the importance and necessity of localizing all surgical lesions of the higher urinary tract, and emphasizes the fact that exploratory operation in this day and age is rarely, if ever, needed.

The author believes that in conditions of the upper urinary tract exploratory operation should always be preceded by an accumulation of data, which permits of immediate judgment at the operation concerning the surgical procedure to be employed. The history, while it is a valuable guide in examination, is often very unreliable for accurate diagnosis. The presence of pus in the urine always demands an explanation, and the routine tests employed in men are dwelt upon.

The localization of the origin of the pus calls for the services of an expert urologist, and ureteral catheterization is necessary. By means of cystoscopy urethral strictures that are tight enough to cause symptoms are incidentally ruled out. The bladder capacity is noted, as well as the presence or absence of tumors, calculi, ulcers, diverticulae, etc. Even the cystoscopic picture of the ureteral orifices may give a clew to trouble higher up. Roentgen ray examination should be made a routine in all cases.

The value and importance of dye tests are discussed. Indigo-carmin and thalein are the ones most in use as a routine at the present time.

The use of the shadowgraph catheter and the value of the wax-tipped catheter are given due consideration. The author, in conclusion, makes the following statements:

1. Symptoms are often unreliable, sometimes positively misleading.

2. Careful and complete examination is essential for diagnosis, and means are available to arrive in most instances at accurate clean-cut diagnoses.

3. In men "cystitis" is rarely a justifiable diagnosis. It is nearly always a secondary consideration, and the burden of proof is on him who diagnoses a case as primary cystitis. H. L. KRETSCHMER.

Taylor, G.: *Some Indications for Nephrectomy*. Practitioner, Lond., 1917, xcix, 57.

A decided diminution in the immediate mortality from the operation of nephrectomy and the more satisfactory end-results in cases submitted to this operation have been noticeable features of the renal surgery of recent years. This improvement is due partly to earlier and more accurate diagnosis of disease, partly to the greater attention devoted to a thorough investigation of the functional capacity of the remaining organ, as well as to improvement in the technique of the operation itself. The author contrasts Tuffier's statistics of 1890—38.4 per cent—with Fullerton's of 1913—6.2 per cent.

As a means of estimating the functional capacity of the sound kidney Taylor has frequently used

the indigo-carmin and phloridzin tests, but in most cases he has contented himself with the simpler procedures of Fullerton; viz., if the urine obtained by ureteral catheter from the presumably sound kidney has a specific gravity of 1.015 or over, if it is free from albumin, pus, and blood, and is secreted in normal quantity, he has no hesitation in removing the offending organ.

Case 1 was an example of congenital cystic disease in a patient 45 years of age with a severe degree of anemia consequent upon excessive hematuria. Such severe hematuria in a case of congenital cystic disease is very exceptional; extirpation of the kidney was necessary to save the patient from death from hemorrhage. According to Luzzato intermittent hematuria occurs in 16 per cent of these cases. Taylor says in view of the facts that the condition is almost always bilateral, and that the second kidney, if not already the seat of the disease, soon takes on the characteristic changes of the diseased organ removed, nephrectomy is never to be contemplated, except in cases of very severe pain or hemorrhage.

Case 2 was an example of hematuria due to unilateral nephritis in a woman 52 years of age. Two years after nephrectomy the patient was in robust health. Many authors have emphasized the importance of performing nephrotomy alone in such cases, but the condition of Taylor's patient was such that if the bleeding had persisted after the less radical operation, she would have been in no state to stand secondary nephrectomy.

Case 3 was one of hypernephroma in a woman aged 69 who suffered from profuse hematuria associated with frequency of micturition. Some months previous she had had her appendix removed by an eminent surgeon. Right-sided nephrectomy was performed because the continued bleeding was rapidly enfeebling the patient. After operation the hematuria ceased, and the frequency disappeared, but the patient subsequently developed recurrence in the flank, and died some six months afterward.

Case 4 was an example of acute hematogenous infection of the right kidney in a cadet at Sandhurst who was lying in a condition of semi-stupor with a temperature of 104° F., a rapid pulse, and passing large quantities of pus in the urine. The kidney proved to be a small hydronephrotic organ which had become acutely infected with a coliform organism and converted into a pyonephrosis. The patient was in excellent health when last heard of. In cases of large pyonephrosis the method of subcapsular nephrectomy, as practiced by Fedoroff of Petrograd and recommended by the Mayo, deserves to be better known than it apparently is.

P. G. SKILLERN, JR.

Schneider, J. F.: Tests for Estimating the Functional Efficiency of Kidneys. *Wis. M. J.*, 1917, xvi, 119.

Schneider reviews the history of urinary examinations. Progress along these lines is traced to the

present day with our modern urological procedures, such as cystoscopy, ureteral catheterization, and tests of the renal function. The history and details of various tests of kidney function are described, beginning with cryoscopy and including methylene blue, phloridzin and indigo-carmin. The method of application and the value of these tests is discussed. The author then takes up the phenolsulphonphthalein test in detail and after a full description of its use, concludes that work done with this test since its introduction in 1911, "justifies the claim that this test gives the most reliable information regarding the efficiency of the kidney function, and makes it unnecessary at the present time to modify any of the original statements of its authors."

J. D. BARNEY.

Tchertkoff, J.: Indicanæmia, a Symptom of Renal Insufficiency (*L'indicanémie, symptôme d'insuffisance rénale*). *Rev. méd. de la Suisse Rom.*, 1917, xxvii, 487.

Tchertkoff says that he was the first to point out the true significance of indicanæmia. His studies have shown him that it is a sign of severe renal insufficiency. The technique of his method for discovering indican is as follows: 8 to 10 ccm. of serum obtained from scarification or venous puncture of the fasting patient is added to an equal quantity of 20 per cent trichloroacetic acid. This is filtered and to 10 ccm. of the filtrate is added an equal quantity of a solution of concentrated hydrochloric acid containing 8 gr. of perchloride of iron per liter. This is shaken and 3 ccm. of chloroform added. Upon examination 15 minutes later the chloroform will be found to vary in color from pale to deep blue according to the quantity of indican in the serum. If there is no indican the chloroform does not become colored. If the serum contains iodides the chloroform takes on a rosy tint, and it is well to exclude iodides before making the test for indican.

In acute nephritis with renal insufficiency indicanæmia first appears when azotæmia reaches nearly 1.50 gr. per liter.

The author concludes that his method is a simple one within the reach of all practitioners. In his opinion the presence of indican in the blood demonstrates a severe renal insufficiency corresponding to an azotæmia of 1.5 per cent. Indican is never found in patients with renal sufficiency. In chronic nephritis the presence of uræmia is a sure precursor of death. It is only a matter of weeks or months.

In acute nephritis the renal insufficiency is only temporary. In certain cases of azotæmia under the influence of treatment or functional incompetency the quantity of urea scarcely exceeds the normal. Study of indicanæmia will furnish more exact results than study of azotæmia, both as regards diagnosis and prognosis. In spite of a minimum azotæmia the gravity of the renal insufficiency is established if indicanæmia is demonstrated.

The study of indicanæmia also answers certain theoretic questions. True uræmia is a retention of different substances produced in the organism and not alone a retention of urea. W. A. BRENNAN.

Beer, E.: *The Significance of Ureteral Tubercle Bacilluria.* *Am. J. M. Sc.*, 1917, div. 251.

The problem is replete with difficulties which may be encountered by those dealing with patients suffering from urogenital tuberculosis. Very few categorical statements are permissible. In each individual case it is necessary for the surgeon to weigh the evidence carefully before determining whether he is dealing with a case of renal tuberculosis or not.

Tubercle bacilli may be present in ureteral specimens under three conditions, even though their presence usually indicates a renal tuberculosis:

1. When there is a tuberculous focus in some other part of the body and the bacilli are excreted from a non-tuberculous kidney.

2. When there is a tuberculous focus in the genital or urinary tract by contamination or by ureteral reflux.

3. When the tuberculosis is in the upper urinary tract or kidney.

Three cases are carefully reported. The author makes no categorical statements as to the significance of the ureteral tubercle bacilluria as each case must be decided upon its merits, and only after such careful study as each patient will permit is it possible to decide as to whether the tuberculous disease has involved the kidney or not. Before one has reached a definite decision that the ureteral tubercle bacilluria is due to renal tuberculosis, the next step, removal of the kidney, must be relegated to the future.

EDWARD L. CORNELL.

BLADDER, URETHRA, AND PENIS

Squier, J. B.: *Vesical Neoplasm.* *Am. J. Surg.*, 1917, lxxi, 225.

The author's conclusions are based on the collected reports of various observers dealing especially with the incidence of benign as compared with malignant new-growths of the urinary bladder, together with the prognosis of each type following different methods of treatment. With one exception, these observers are of the opinion that malignant tumors outnumber benign tumors of the bladder, and present numerical values to verify this opinion. Adenoma, angioma, myoma and sarcoma are briefly discussed.

A considerable advance in methods of treating vesical malignancy is apparent by a comparison of Rovsing's statistics in 1908 of 80 patients with more modern reports. Of his 80 patients, 54 were treated by ablation of the mucous membrane and pedicle with 7 cures after a period of five years. In 5 patients, resection of the bladder wall and the tumor resulted in 1 patient remaining free from recurrence for one and one-half years and 1 for one

year. Three total cystectomies gave fatal recurrences within a year.

More modern treatment of these conditions characterized by earlier diagnosis and more complete resections produces more hopeful results, as seen in Gardner's statistics of 442 collected cases in which excision of the growth only is attempted, with 88 per cent mortality; whereas in 224 cases of partial resection, recurrence takes place in 43 per cent. Here a gain of 50 per cent warrants but one conclusion.

Complete extirpation of the bladder preceded by transplantation of ureters or nephrostomy is applicable only to infiltrating tumors involving the trigone and vesical neck. The operation is often a failure due to the advanced stage of the malignancy which contra-indicated any other procedure. Later deaths are usually due to renal infections, especially those with colonic or rectal ureteral transplantation.

The unanimous opinion regarding the treatment of vesical papilloma is removal by fulguration. Some prefer the Oudin monopolar spark while others favor the D'Arsonval bipolar. It is generally believed that fulguration is only of value in checking hæmorrhage in malignancy, while for papilloma it is curative.

HARRY CULVER.

Wynne, H. M. N.: *Observations on the Degeneration of Leucocytes in the Urine as a Diagnostic Aid in Tuberculosis of the Urinary Tract in Women.* *Bull. Johns Hopkins Hosp.*, 1917, xxviii, 251.

In 11 cases of renal tuberculosis, the tubercle bacillus was demonstrated in 10. Unfortunately the other case did not show any leucocytic degeneration, nor were red blood-cells seen in one examination.

Acid-fast bacilli have not been found in any case of non-tuberculous pyuria, although numerous smears have been examined carefully. In all 72 cases of pyuria were noted, in 27 of which the possibility of tuberculosis could not be positively eliminated, and these cases have not been tabulated. The majority of these patients were not under observation long enough to be thoroughly studied.

The table includes 11 cases of renal tuberculosis, for which nephrectomy was performed, 15 cases of non-tuberculous pyuria in which the possibility of tuberculosis was definitely eliminated by operation or autopsy, and 20 cases in which there was no operation, but the clinical picture and results of treatment rule out tuberculosis.

The voided urine from five patients contained well-preserved leucocytes, whereas in the catheterized specimens there were no leucocytes.

Degenerated leucocytes in the urine are not pathognomonic of tuberculosis of the urinary tract, but a marked degeneration is strongly suggestive of this disease. The absence of degeneration of leucocytes does not eliminate tuberculosis. The cytological study of the urine cannot replace the demonstration of tubercle bacillus or animal

inoculation as a means of diagnosis; at best it offers presumptive evidence. EDWARD L. CORNELL.

Krotoszyner, M.: Upon the Modern Treatment of Bladder Tumors. *Calif. St. J. Med.*, 1917, xv, 350.

The author summarizes a consensus of medical opinion regarding the pathology of bladder tumors as follows:

"It is generally assumed, at present, that villous vesical tumors as a rule are only apparently benign, that they may harbor a malignant nucleus and that originally benign papillomata may become malignant by metaplasia. Thus it may occur, most frequently, that a truly malignant growth is treated like a benign neoplasm."

Moreover, the histological examination of tumor particles either eliminated spontaneously with micturition or in the course of bladder-irrigation, or obtained by intravesical application of cystoscopic scissors or rongeur, is often frustrated as regards diagnostic reliability and shorn of its value as a therapeutic index. By good authority it has been advised to consider every bladder tumor *a priori* as malignant and treat it as such. Equally radical surgical measures have been recommended and occasionally carried out in the presence of insignificant and pedunculated papillomata, as against infiltrating broad-based neoplasms possessing all the earmarks of malignancy.

The author raises the question of the advisability of removing bladder tumors in face of the recognized poor end-results of radical surgery, and quotes in justification the reports of Guyon, Albarran, Weir, Casper, and Stein who observed vesical neoplasms that had existed from 29 to 42 years without distressing symptoms.

Krotoszyner reports two cases illustrating a similar observation. One case, aged 70, upon cystoscopic examination in 1906, showed papillary carcinoma and has, without treatment, except for an occasional attack of hematuria, suffered from no local symptoms and at present enjoys good health. In another case, aged 64, a typical broad-based infiltrating carcinoma was observed 15 months ago and the patient's present condition both locally and generally remains entirely satisfactory without treatment. For the control of hematuria in this malignant case, not subject to operation, the author advises injections of highly concentrated nitrate of silver, 100 ccm. of 1:1,000 to 1:500 solution, and this treatment repeated every second or third day.

In conclusion, fulguration is advised for every bladder tumor until lack of success has proved the inefficacy of the treatment. Next, excision of the tumor through suprapubic cystotomy should be considered, unless located near the trigone or involving one or both ureteral openings. Those cases in which transplantation of one or both ureters would be necessary are better reserved for more conservative or expectant treatment, although Watson's bilateral nephrostomy as a sequel to total cystectomy in the face of distressing symptoms

may be indicated as preferable to a continued miserable existence. FRANK HISMAS.

Kirby, E. R.: Some of the More Unusual Affections Involving the Deep Urethra and Bladder. *Penn. M. J.*, 1917, xx, 755.

The author makes a plea for a more thorough endoscopic and cysto-urethroscopic examination in hitherto undiagnosed conditions involving the deep urethra and neck of the bladder. The conditions mentioned which have been previously mistreated are lesions of the sphincter edge, such as bullous oedema and polypi and papillomata in various portions of the deep urethra. Particular attention is called to the pathology of the colliculus, where such conditions described as erosions, granulations, polypi, cysts, papillomata, and deformities of various types are found. I. S. KOTT.

GENITAL ORGANS

Watson, E. M.: Prostatic Hypertrophy with Tabes. *N. Y. M. J.*, 1917, cvi, 448.

Not infrequently prostatic hypertrophy is complicated with tabes dorsalis which may not be recognized, and the presence of this complicating factor alters the method of treatment to be followed. In early tabes, definite clinical signs are frequently absent. The presence of residual urine, frequency, difficulty in starting the stream, dysuria with some dribbling after voiding, and incontinence, is a picture commonly presented by either disease and also by the two together. It is very important that the proper diagnosis be made in these cases, and a thorough neurological and urological examination should be made. As to the method of treatment, it requires judgment and experience with both the spinal and prostatic bladder. With definite middle or lateral lobe hypertrophy, prostatectomy may be considered. If there is incontinence with considerable residual urine for which the prostatic hypertrophy seems responsible, the perineal method is the route of choice. If there is no incontinence the suprapubic should be the route of choice. For median bar obstruction the Young punch operation is advised. H. G. HAMER.

Kretschmer, H. L.: Benign Hypertrophy of the Prostate and Its Treatment by Suprapubic Prostatectomy. *Surg. Clin. Chicago*, 1917, i, 811.

The author cites a number of cases and emphasizes the fact that a careful examination must be made in all cases of urinary trouble, especially in elderly men, as carcinoma of the prostate is more common than previously believed. He also emphasizes the fact that time is an important factor in these operations and that the less time it takes to remove a prostate, the better the results. The method of operation and the preliminary preparations depend upon the individual patient.

The anæsthetic used also depends on the patient. The author uses one of the following: (1) ether; (2) gas-oxygen; (3) sacral or spinal.

A pre-operative study of each case is necessary for an accurate diagnosis, to rule out all other lesions; for a careful study of renal functions; for a careful, comprehensive differential diagnosis.

These result in a better preparation of the patient, a smaller mortality, and quicker work.

In conclusion the author emphasizes the fact that cystoscopic examination before operation, and control of hemorrhage following operation are two important factors.

A. C. STOKES.

Judd, E. S.: Infections in Prostate Cases. *Ann. Surg.*, Phila., 1917, lvi, 362.

In a somewhat detailed study of a small series of cases, the author has attempted to ascertain, as nearly as possible, the part infection plays in the reactions which take place during the pre-operative treatment of patients, either by draining the bladder through an urethral catheter or through a suprapubic opening.

He believes that infection in the kidney is the most important factor to be taken into consideration, and he questions whether many of these patients do not have a more or less chronic infection of the kidney from the beginning of the urinary symptoms. That a kidney may be infected without passing organisms into the urine continuously the author has been able to prove at autopsy in several instances; during life the urine was free from evidence of infection, although at autopsy considerable evidence of infection was found.

Three routes by which the infection reaches the kidney are mentioned: (1) by the blood stream; (2) by way of the urinary passages; (3) by the lymphatics. Judd believes that the infection reaches the kidney by extending into the lymphatics and then entering the blood stream.

The effect of the infection on the renal function depends on the part of the kidney involved. If the infection attacks the cortical part, the renal function may appear normal; if the infection enters the region of the tubules the phthalein output is usually greatly diminished.

In nearly all examinations in which blood cultures were made in this series of cases, the cultures were negative. Cultures of the urine in five cases showed that before treatment of any kind was instituted, *staphylococcus albus* was demonstrated in four. Four or five days after beginning pre-operative treatment or after prostatectomy, all five cases showed colon bacilli in addition to the *staphylococci*.

Judd draws the following conclusions:

1. In prostatic cases a definite reaction occurs during the pre-operative treatment. In some cases this reaction may be due to infection in the kidney.

2. Several days after the beginning of the treatment, or after the operation has been performed, in a very large majority of cases the urine shows a considerable number of colon bacilli. This cannot be due to contamination in every instance, al-

though it is impossible to say whether it comes from the kidney, the bladder or the prostate itself.

3. The infection may be walled off in the kidney and no organisms will show in the urine. Simultaneously with any form of treatment, the infection becomes active and the urine immediately shows bacteria.

4. Colon bacillus vaccine may modify the infection, though it does not decrease the number of bacilli in the urine.

H. L. KRETSCHMER.

Payne, R. L., Jr.: Surgery of the Prostate. *Virg. M. Semi-Month.*, 1917, xxii, 235.

Payne has reported a series of 55 suprapubic prostatectomies with one postoperative death, and ascribes this low primary mortality to the fact that he never employed either continuous irrigation or the indwelling catheter after the operation. Continuous irrigation, according to the author, is a hindrance to clotting in the prostatic cavity, while the indwelling catheter is liable to cause fatal embolism by producing vesical and sphincter spasm and thus forcing clots into the general circulation.

Particularly noteworthy are several points in the author's technique. Preliminary distention of the bladder before cystotomy is never practiced. The usual midline incision is used with the exception that one of the recti muscles is divided, as the nutrition of muscle is held to be more favorable to early healing of the fistula than an incision in the dense midline fascia. The bladder is opened between two towel-clamps by means of a clean cut of the entire opening desired; enucleation is effected easily and quickly by striking the line of cleavage first in the roof or lateral walls of the urethra, except when removing the small and hard fibrous gland. In this case a V-shaped piece of tissue is removed by scissors, the area of excision extending well out to each lateral wall of the urethra and posteriorly to the rectopelvic fascia. Immediately following enucleation the cavity is packed with one large dry gauze pad firmly pressed into the site of the enucleation, followed by a second pad held tightly in the cavity until all oozing is controlled. Hemostasis by these means should be kept up for at least five minutes by the clock. Then a cigarette drain three-fourths of an inch in diameter, with a large fluffed end, is inserted into the prostatic cavity, and finally the bladder and abdominal incisions are sutured up to the drain.

Essential features of the postoperative care are the following: Immediately upon return to bed one quart of plain warm water is given per rectum, and one pint every four hours thereafter. One or two grains of sparteine sulphate is given hypodermically every four hours for two days. The cigarette drain is removed at the end of forty-eight hours, and the bladder is then irrigated twice daily through the suprapubic fistula with a solution of hydrochloric acid, 1:500 to 1:250. By these means the suprapubic fistula is generally closed about the fifteenth day after operation.

For purposes of anesthesia nitrous oxide is considered preferable to ether or chloroform. The author is most favorably impressed with the results of local anesthesia (novocaine infiltration), and he is convinced that removal of enlarged prostates under local anesthesia gives the greatest margin of safety. In conclusion the author emphasizes the danger of procrastination in the necessary operation on the part of the family physician. The best time for surgery as a rule is when the lesion is first discovered.

M. KROTHENNER.

Kollischer, G., and Eisenstaedt, J. S.: A New Method of Anesthesia in Prostatectomy. *Surg. Clin. Chicago*, 1915, 1, 805.

The authors state that in order to make local anesthetic a success, the anatomy of the region must be well known and the anesthesia must be complete.

The periprostatic plexus is first thoroughly infiltrated by way of the perineum with Schleich's solution. Next the bladder is filled with a 2 per cent protargol solution containing antipyrin to relax the patient. Before operation a full dose of morphine is administered so that the patient does not suffer any shock when the first injection is made.

A wide area of the skin, fascia, and tissues is injected so that there is no shock when traction is made by the retractors. Upon opening the bladder, traction is made on the prostate. If there is no pain, the perineal injection was successful; otherwise more solution must be injected.

A. C. STOKES.

Deaver, J. B.: Prostatectomy. *Ann. Surg., Phila.*, 1917, lvi, 371.

The author considers the value of functional tests and cystoscopic examination; pre-operative treatment and a selection of cases for prostatectomy are given careful consideration.

He has divided cases of vesical obstruction into three groups:

Group 1 may be made to include those cases of early prostatic hypertrophy that present few subjective signs, in which the bladder capacity is approximately normal with small amounts of infected or non-infected residual urine, a normal phthalein output and no serious organic defects of the heart or blood-vessels. Cases of this kind may be operated upon when the patients are acclimated to their hospital surroundings; when the various tests have been carried out and after a cystoscopic examination has been made without deleterious after-effect.

Group 2 includes cases in a later stage of prosta-

tiam with or without marked secondary systemic symptoms. The residual is generally large and may or may not be infected. The bladder walls are atonic and the diminution in kidney function is dependent almost entirely upon back pressure. Patients in this group are often fair surgical risks at the outset and will become excellent risks with the institution of proper pre-operative treatment.

Group 3 includes cases in which a small contracted, severely ulcerated bladder gives rise to distressing symptoms. There is generally an infection of the upper urinary tract. The obstruction is frequently of the stricture variety and of inflammatory origin, or if the obstructive factor is an adenomatous mass, it is usually of the horse collar or ball valve type. The mortality is high and the morbidity dependent upon operative complications great.

H. L. KRETSCHMER.

MISCELLANEOUS

Walther, H. W. E.: Hematuria; Its Clinical Significance. *N. Y. M. & S. J.*, 1917, lxx, 907.

In a high percentage of cases, hematuria is the first and only symptom of malignancy somewhere along the urogenital tract. Hematuria is encountered most frequently in cases of tumor, calculus, tuberculosis, or infection somewhere along the genito-urinary tract. Of 78 cases observed by Walther tumor of the genito-urinary tract was the most frequent cause of hematuria, occurring 36 times, or in 51 per cent of the cases, of which 19, or 72 per cent, were carcinomatous.

H. G. HAMER.

Buerger, L.: New Combination Observation, Catheterizing, and Operating Cystoscope. *N. Y. M. J.*, 1917, cvi, 347.

In this brief article, the author describes a new type of cystoscope which he has been able to develop after much experimentation. The sheath of the catheterizing cystoscope has been reconstructed so that the same sheath which is used for catheterization can also be used with the operating cystoscope, with the result that the patient is spared the pain and necessity of having a second instrument introduced into the bladder after a diagnosis that requires intravesical operative procedure.

A narrower deflector in this instrument became necessary, and the manipulation of the ureteral catheters is in consequence slightly more difficult. The author believes this feature to be of minor importance, considering the advantages gained in the use of the combination instrument.

H. L. KRETSCHMER.

SURGERY OF THE EYE AND EAR

EYE

Conse and De Lord: Fragments of Bony Tissue in the Vitreous Body (Fragments de tissus osseux dans le corps vitré). *Rev. gén. de clin. et de thérap.*, 1917, xxxi, 552.

A soldier with a penetrating wound of the cornea developed symptoms which necessitated enucleation. On examining the enucleated eye three foreign bodies were found in the vitreous which had all the appearance of bone tissue and were found to be that. There was no fracture either of the orbital walls, of the face or of the limbs, so far as could be discovered. Further inquiry showed that one of his comrades who was wounded in an explosion at his side showed multiple fractures. It was from this wounded comrade that the bone fragments had been projected into the eye of the author's patient.

W. A. BRENNAN.

Tilderquist, D. L.: Prescribing Lenses After the Use of Cycloplegics. *J. Lancet*, 1917, xxxvii, 610.

The author states that cycloplegia is the most exact method possessed for determining the refraction of the eye. It happens quite often, however, that the patient experiences discomfort from glasses prescribed after its use. Tilderquist believes that the main error of the prescriber is overcorrection. In uncorrected hyperopia the ciliary muscle has developed abnormally in attempting to carry the extra strain; when a full correction is given, the ciliary muscle will relax only a part of this added tonus and the patient experiences discomfort. In myopia, the reverse is true; the ciliary muscle is partly atrophied from disuse and it will not take up without protest the activity which a full correction calls for.

In forming a true judgment as to the amount of the total spherical error to correct, the cylindrical error, in general, being corrected in full, the writer has found the method of Le Fever, of Philadelphia, extremely useful. This investigator has determined in a very definite way the influence which the factor of age has upon ciliary activity. His tabulated results show that in hyperopia the patient who has not previously worn glasses accepts a gradually diminishing percentage of his total error from childhood onward to the age of about 32, and that in myopia there is a gradual loss in the power of accommodation from the age of 15 onward to about the age of 35, at which latter age the power of accommodation has entirely disappeared. For instance, a hyperope at the age of 10 will accept with comfort approximately 80 per cent of the total error; at 20, 50 per cent; and at 30, 30 per cent; the myope up to the age of 15

will accept full correction; at 20, about 75 per cent of full correction; at 25, about 50 per cent, and so on. In either case, if the patient has previously worn glasses, the calculation is based on the difference between the old correction and the total error as found under cycloplegia.

The writer has followed this method for at least five years and has found it in the main very satisfactory. It is invaluable in cases in which post-mydiatic examinations can not be done.

EAR

Stein, O. J.: Sudden and Profound Deafness; Its Significance. *J. Am. M. Ass.*, 1917, lxix, 706.

The author does not consider such types of deafness as present slight or only partial impairment of hearing, even if taking place suddenly; nor cases in which profound or absolute deafness ensues gradually from chronic changes in or about the hearing apparatus. Only profound cases of deafness which appear suddenly are discussed and illustrated with case reports. The following conditions are mentioned:

1. Bleeding in the middle ear in a case of pernicious anæmia.
2. Hemorrhagic effusions into the labyrinth.
3. Syphilis of labyrinth, eighth nerve or brain centers.
4. Diffuse labyrinthitis.

OTTO M. ROTT.

Long, C. H.: The Radical Mastoid Operation; Its Termination with Reference to Hearing and Suppuration. *Illinois M. J.*, 1917, xxxii, 171.

The author has reported his results of the mastoid operation in a series of twelve cases, with special reference to hearing and suppuration.

He concluded that failure to stop the discharge was often due to an insufficient knowledge of the anatomy, a disregard or ignorance of the variations of type of the individual human skull, or a failure to make the meatal opening large enough to secure proper drainage and permit proper cleansing.

Undue haste, operating without warrantable indications, and neglect of subsequent inspection and care of the ear might also cause unfavorable results. He states that a recurrence of the suppuration was more frequent when the eustachian tube was closed than when it was open; and that the infection entered from the external auditory meatus.

His experience led him to feel that the radical mastoid operation was fully justified since the suppuration was cured in 100 per cent of his cases and the hearing was either unaffected or improved in 80 per cent of his cases.

Dench, E. B.: Indications for the Mastoid Operation in Acute Otitis Media. *J. Am. M. Ass.*, 1917, lxi, 878.

The author outlines the classic symptomatic indications for operative interference in acute mastoiditis. Proper drainage of acute middle ear infection through the drum membrane effects a mastoid recovery with a minimum of surgical interference. The mastoid is a part of the middle ear, and therefore every middle ear infection a mastoiditis. If drainage through the middle ear is insufficient, either on account of the virulence of the infection or the peculiar topography of the mastoid, posterior drainage must be instituted.

The persistence of severe pain or the continuation of pain for twenty-four or forty-eight hours after incision is an indication for posterior drainage. A persistent high temperature or remittent temperature indicates posterior drainage. The author lays particular stress on recurrent tenderness, e.g., the initial tenderness disappears, the mastoid becomes practically insensitive to pressure; in the course of a few days the tenderness returns, and is more marked at the antrum.

The signs found on instrumental examination, the author believes, are the most important. It reveals insufficient drainage through the drum membrane, and discloses a bulging of the upper and posterior portion of the drum membrane, together with a sinking of the corresponding adjacent meatal walls. Bacteriologic examination is of

considerable importance, since the unusual forms of micro-organisms can be detected. The streptococcus capsulatus gives rise to most persistent symptoms and calls for a posterior drainage. No case of this sort should be considered safe. Patients should be under observation until the middle ear has returned to normal condition, hearing returned to the standard previous to operation, and all canal signs have absolutely disappeared.

A profuse discharge lasting more than three weeks or a discharge which suddenly stopped is an indication for posterior drainage. A single competent incision of the drum membrane for acute otitis media will drain the middle ear and adjacent structures. The moment that it is necessary to repeat these incisions the indication for posterior operation becomes imperative. The author condemns repeated incisions of the drum membrane, since it tends only to mask the symptoms and causes destruction of the deeper tissues.

Impairment of hearing, which is persistent after an acute attack, vertigo and persistent nystagmus, usually toward the diseased side, mean extensive infiltration of the bony structure surrounding the labyrinthine capsule, and operative interference in all such cases is indicated.

Localized headache or severe general headache are dangerous meningeal symptoms. The author recommends spinal puncture. X-ray is of value in older cases. In acute cases the radiograph shows a cloudy mastoid.

M. A. BERNSTEIN.

SURGERY OF THE NOSE, THROAT, AND MOUTH

THROAT

Loeb, H. W.: The Susceptibility to Infection Manifested by the Remains of Incompletely Removed Tonsils. *Tr. Am. Laryngol. Ass.*, N. J., 1917, May.

If a portion of the tonsillar lymphoid tissue is left after operation, especially if it happens to contain a crypt, it is very much inclined to persist in *status quo*. It may never occasion any unpleasant result, but it is present nevertheless with its susceptibility to infection, reduced though it may be. What is considered an atrophied tonsil usually signifies that the tonsil tissue has become somewhat more covered by the anterior pillar and has in part simply disappeared from view.

There must be a not inconsiderable number of cases in which tonsillar stumps remain, even in the practice of the most experienced operators, and the author cites five cases showing infection originating in such tonsillar remains.

These cases definitely show that small masses of tonsil tissue overlooked, or at least not removed at the operation, are susceptible to infection with remote effects similar to those which follow acute tonsil infections. They must have their counterpart in the practice of other laryngologists, and from his own experience Loeb believes it must be common enough to constitute a fairly definite clinical entity. They present a decisive argument against any form of operation which does not contemplate the entire removal of the tonsil, especially where there has already been some infective processes originating in the tonsil.

They suggest the advisability of following up cases of tonsillectomy to determine whether any portion remains and whether it has become a focus of infection.

Watson, A. W.: Report of a Case of Carcinoma of the Larynx Treated with Radium. *Tr. Am. Laryngol. Ass.*, N. J., 1917, May.

A physician, about seventy-three years of age, presented himself November 24, 1914, with a history of increasing hoarseness for a year, without inflammatory symptoms, pain or cough; the general health was good, the general history was negative.

Examination of the larynx showed a smooth, red, sessile growth or swelling on the left side beneath the vocal cord, extending from the anterior commissure backward about one-half the length of the cord, and downward from the cord about one-half inch. It seemed to involve the under surface of the cord.

Movement of the anterior half of the cord was restricted, which caused bowing in phonation. The growth was sharply defined and the other parts of the larynx appeared to be healthy. A clinical diagnosis of carcinoma (epithelioma) was made. For obvious reasons a microscopic examination was not made.

When first seen by the author the growth was one that could, undoubtedly, have been removed by laryngofissure, but in consideration of the age of the patient and the fact that he was in favor of trying the effect of X-ray or radium, it was decided not to operate.

The radium was applied to the outside of the larynx: 11 milligrams radium, filtration one millimeter of lead and one and one-half inches of gauze, for three hours. This was repeated in February (six treatments, 198 mg.-hours). March 1 the radium was increased to twenty milligrams, filtration one milligram lead, one-half inch gauze, applied for three hours. This was repeated (six times, 360 mg.-hours). March 17 forty milligrams of radium were used, filtration same as before, applied for three hours. This was repeated (six times, 720 mg.-hours).

Various applications were made, none of them satisfactory, and it had to be abandoned. The external application of the radium was again instituted in the following dosage: 40 milligrams radium, filtration one millimeter lead and one-half inch gauze, applied five hours July and August (in all nineteen applications, 4,200 mg.-hours).

September 23, about one month after discontinuing the radium, it was noted that the growth was apparently gone. The left vocal cord was a little slower in movement than the right, and the skin inflamed over the larynx.

On the second of April, 1917, the patient returned with hoarseness, which he had noticed for a month or more. Examination showed a small nodule beneath the edge of the left vocal cord near the anterior commissure, the site of the old trouble. Radium was again used, a few days later, 40 milligrams, for twelve hours. The larynx was examined two weeks later. The growth was found to be smaller, the neck inflamed. April 25, only a slight thickening remained. The voice was again almost normal. The same condition was present when last examined.

From the results seen in suitable cases, and with a better knowledge of the dosage, better results may be expected, especially if the radium can be applied from within the larynx, which would be made easier by a tracheotomy.

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INTERNATIONAL ABSTRACT OF SURGERY

FEBRUARY, 1918

COLLECTIVE REVIEW

LOCAL AND SPINAL ANÆSTHESIA

By ARTHUR E. HERTZLER, M.D., F.A.C.S., KANSAS CITY, MISSOURI

THE literature on local anæsthesia which has appeared during the last three years may be divided in general into three classes. The first includes those papers in which the author describes his first few cases operated upon under local anæsthesia. These papers express the delight of the author at having found something that is new, and are often of value. A second class of papers is concerned with the major operations not usually undertaken under local anæsthesia, and present in a measure the extreme range of possibilities. These do not always reflect keen judgment, but are useful in that they serve to keep the audience awake to the advantages of local anæsthesia. The third class of papers include those by writers who have studied details in the technique of local anæsthesia with discernment and understanding.

On the whole, recent literature indicates a vastly widening appreciation of the advantages of local anæsthesia. A general knowledge of the subject is taken for granted and minor subjects are not considered. Abdominal surgery is being done under local anæsthesia much more generally than formerly and operations about the neck and genital organs are being accepted by many surgeons as most properly attacked under local anæsthesia.

DRUGS EMPLOYED

Novocaine is very generally the drug employed. The strength of solution generally used is one-half to one per cent with stronger solutions up to two per cent for blocking large nerves. No toxic symp-

toms have been recorded. McCardle (91) reports a case in which death occurred after a small amount of novocaine was used in the skin. Larger amounts of the drug are being employed than were formerly regarded as safe. Jacoby (75) used 19 grains in one case and 23 grains in another without harmful results. Daugherty (27) has used 250 ccm. of one-half of one per cent of novocaine and Jacobson (74) has used 12 ounces of one-half per cent novocaine in a case of bilateral inguinal hernia. Kroenig and Siegel (81) have used as much as 1.65 grams in a single operation. The last named authors note that these large doses cause a smaller and more rapid pulse. Morian (94) studied the urine after local anæsthesia. He found albumin in five to ten per cent of cases in amounts varying from a trace to 0.5 per thousand. It began a few hours after the operation and lasted forty-eight hours. A few casts were found. It occurs usually in patients who have postoperative vomiting. Hogan (65) thinks the kidneys are injured by the acid production from the increased muscular tonus. According to him this should be avoided by local anæsthesia. Harris (58) had one case of postoperative pneumonia in 380 cases.

Cocaine continues its reign of frightening, if not frightfulness. Engstad (30) records alarming symptoms following the instillation of a few drops of a two per cent cocaine solution into the conjunctival sac of a girl of twelve. The alarming symptoms subsided after inhaling four breaths of ether. Smith (124) finds nitroglycerine an effective antidote. He uses "small amounts" of this drug regularly in the solution in order to

forestall any unpleasant symptoms. As a matter of economy Hall (55) advises that solutions of cocaine be made in glycerine of starch. This solution does not evaporate, does not disintegrate, and may, therefore, be kept for a long time. It is suited for application to any mucous surface. Virden (137) does not believe cocaine is rendered ineffectual for use in ophthalmic practice by prolonged or repeated boiling.

Quinine and urea hydrochloride has a few advocates. Amster (7) has used it extensively in one-eighth to one-fourth of one per cent solutions. Failure to secure anesthesia he rightly ascribes to the failure to inject the solution in the proper tissue, and sloughing he recognizes as being due to the use of too large amounts of the solution. Du Bose (33) uses quinine and apologizes for the shortcomings of the drug by the statement that it is not "fool proof." To this may be added the observation of Strachauer (133) that the important question in local anesthesia is not what drug is used, but where and how it is injected.

The new drug apothesine has received a try-out in the hands of Allen (5) and Dyas (34). They reach the rather surprising conclusion that it is the equal of novocaine. Allen finds the addition of chlorotone a disadvantage because of the smarting it causes at the time the infiltration is made. My experience with the drug would lead me to compare it with quinine rather than novocaine.

Several authors have described solutions of standard drugs under trade names. Allan (4) describes eudrenine which is, as its name implies, a combination of beta-eucain and adrenalin. Bunge (30) describes a solution of eucain containing extract of hamamelis. These combinations are evidently intended for those whose education in mathematics does not enable them to calculate the strength of solution desired.

Little new apparatus has been introduced. Most operators use simple syringes of five or ten ccm. capacity. Farr (40) describes an elaborate air pressure apparatus for forcing the fluid into the tissues. Bartlett (11) describes a syringe with a two-way stopcock, enabling the operator to fill the syringe from a container to which it is attached by means of a rubber tube, without withdrawing or removing the needle. This author describes other apparatus devised by other surgeons. The objection to such apparatus is that it complicates the technique, destroys the nicety of touch by limiting the mobility of the needle, and leads to the use of excessive amounts of the anesthetic solution.

PRELIMINARY NARCOTIC

Most operators employ a preliminary narcotic. Morphine in one-sixth to one-fourth grain doses is generally used. Some surgeons use larger doses. McGlinn (92) uses one-fourth of a grain of morphine and one-hundredth of a grain of scopolamine, and if this is not sufficient to allay restlessness the dose is repeated in half an hour. This author feels very strongly on the subject, for he states that "to operate on a conscious patient, unless for some well-defined reason he cannot be put to sleep, is nothing less than brutality." The author gives strychnine with the last dose to counteract the depressing effects of the narcotic mentioned. Schall (111) uses pantopon instead of morphine. It is claimed for this drug that it is more analgesic and less depressant to the respiratory centers than morphine and is less likely to be followed by nausea and vomiting. Kroenig and Siegel (81) use narcophine. Hurd (71) uses one-eighth of a grain of morphine and one-hundredth of a grain of hyoscine hydrobromate to eliminate fear and psychic shock. After the use of the above dose if the patient is still apprehensive a dose of half the amount is given.

SPECIFIC OPERATIONS

Many collected case reports have been published indicating that a large number of operators are availing themselves of the advantages of local anesthesia in a large variety of cases. In most of these standard technique is used with satisfactory results. Some of them emphasize small points of value in technique. Farr (42) calls attention to the value of elevating the abdominal wall with retractors and causing the intestines to fall away from the wound by gravity in order to facilitate exploration by inspection.

ENUCLEATION OF THE EYE

As in tonsillectomy, there seems to be no wrong way to use local anesthesia in evisceration of the eyeball. Illig (72) describes a representative technique. He uses 2.5 ccm. of one-half of one per cent novocaine solution. The injection on the nasal sac is made just above the lachrymal caruncle and on the temporal side at the external angle of the lids. Gradle (51) attempts to reach the ciliary ganglion. He warns against this procedure except when the eyeball is to be removed.

It is of interest to note that Fernandez (44) has observed paralysis of the external rectus following spinal anesthesia. He notes that twenty similar cases are recorded in the literature. It seems that this complication comes after the use of stovaine

only and that ultimate recovery always follows. The condition must be rare, for Boyd and Yount (18) in over six thousand anæsthesias with this drug observed no instance of ocular palsy.

OPERATIONS ON THE NOSE AND THROAT

The current literature presents a wide range of method in the use of local anæsthesia in tonsillectomy. These indicate that any method that succeeds in depositing a limited amount of anæsthetic solution about the tonsil will give satisfactory results. Wilkinson (139) gives one-half grain of codeine just before operating and then paints the surface of the tonsil with six per cent of cocaine solution. He uses one per cent alypin solution for the infiltration. He injects the anterior surface of the tonsil, the superior plica, the middle posterior surface and a few drops beneath the mucous membrane at the base of the tonsil. Thompson (135) proceeds much more simply. He injects between the tonsil and anterior pillar at the level of the lower third of the tonsil. He expects to strike the nerve at the depth of three-fourths of an inch. Lewis (88) after a preliminary injection of morphine begins by swabbing the field of operation with a four per cent cocaine solution followed in a few minutes by swabbing with a ten per cent solution. He then injects a two per cent novocaine solution in the most prominent part of the tonsil, and then in the anterior and posterior pillars. Patton (96) passes a short needle through the center of the tonsil and deposits 15 to 20 minims of the anæsthetic solution just after the point of the needle pierces the capsule of the tonsil.

Harris (57) describes his technique for the removal of the larynx. He uses the usual blocking of the cervical nerves as in thyroidectomy and in addition injects a few drops of the solution into the mucous membrane of the trachea. The pharynx, supplied by the glossopharyngeal nerve, requires special anæsthetization. He tries to avoid the pneumogastrics. It may be added that no serious consequences would ensue should these nerves inadvertently become anæsthetized.

THYROIDECTOMY

Two general plans are followed. The one represented by Lahev (84) involves injecting a layer at a time. A preliminary dose of one-fourth of a grain of morphine is given half an hour before the operation. A two per cent novocaine solution is injected directly into the skin. The incision is made at once. By this plan the tissue about the veins is injected and the vessels ligated without delay. The platysma is next injected and severed.

The region along the mastoid is then injected. The muscles in front of the mastoid are now clamped and cut. The other type of operation is represented by Hertzler (61) who injects the whole field before beginning the operation. The essential points are the blocking of the cervical nerves in front of the sternomastoid muscle. The skin and muscular layers are injected, both to augment the nerve blocking and to secure the vessel-contracting action of the epinephrin.

ABDOMINAL OPERATIONS

Weiner (138) uses one-fourth of a grain of morphine three-quarters of an hour before beginning the operation and usually repeats just before the operation. An ounce of one per cent novocaine solution containing twenty drops of adrenalin then suffices for the operation. Jacobson (74) uses morphine and scopolamine.

Most operators are content to inject the actual field of operation. A few seek by the more difficult method of blocking the spinal nerves at the exit to secure anæsthesia of a wider field. Adam (1) anæsthetizes all trunks from the fifth dorsal to the third lumbar. Kroenig and Siegel (81) block the intercostal nerves from the sixth down in upper abdominal operations and from the eighth down and the iliohypogastric and ilioinguinal in pelvic operations. Jones (76) finds the method "tedious and trying," probably meaning to include both patient and operator.

PROSTATECTOMY

The removal of the prostate under local anæsthesia may now be accepted as a routine procedure. The general principle followed is that after a suprapubic opening into the bladder has been made, the capsule of the prostate is anæsthetized by the injection of the anæsthetic solution following the plan laid down by Legueu (86) in which the prostatic capsule is infiltrated through the bladder. There are as many individual variations in the method of doing this as there are operators, and I dare say each patient represents some minor variation in technique.

Barrington (10) after a preliminary injection of one-fourth of a grain of morphine injects one-half of one per cent novocaine solution into the sheath of the prostate, paying particular attention to the posterior lobes. Under guidance of a finger in the rectum he injects to a depth of one-half to one inch at this point. If pain is caused at any stage of the operation enucleation is suspended and secondary injections are made. Sherwood-Dunn (117) makes injections through five sacral foramina

and has devised an elaborate scheme for the ready localization of the foramina. In cases of obesity he passes the needle into the hollow of the sacrum between the rectum and coccyx. Eisenstaedt (37) elaborates on the technique as generally employed of infiltrating the vesical plexus by passing the needle, guided by a finger in the rectum, through the perineum to the space between the prostate and levator ani muscle, following in this the lead of Perrier (98). The objection to this method is that it requires the introduction of the finger into the rectum, a procedure always liable to carry infection even with the most painstaking changing of gloves. This is an elaboration of the method of Allen (5) and seeks to displace the sacral anaesthesia of Lewis and Bartels (87) and Hertzler (62).

OBSTETRIC OPERATIONS

Sporadic attempts at the control of pain in certain stages of labor by means of local anaesthesia have been made by obstetricians without gaining general acceptance, however. King (77) uses a two per cent novocaine solution, entering the needle two to four cm. above the lower margin of the vagina and two cm. from the rami. The needle is passed to a point just beneath Colles' fascia from two to four cm. Another injection is made between the anus and trochanter, likewise about four cm. deep.

SPINAL ANAESTHESIA

Spinal anaesthesia is used less frequently than formerly in operations on the upper abdomen, but maintains its place in pelvic surgery, particularly in genito-urinary surgery in males. Novocaine seems to have gained a definite place tending to displace stovaine formerly more generally used. Boldt (16) uses a ten per cent solution after removing one-half to one ccm. of spinal fluid.

Although as a routine anaesthetic spinal anaesthesia is regarded as more dangerous than ether anaesthesia, a few operators employ it extensively. Extended use has shown that it is particularly dangerous in certain conditions; by avoiding these the proportionate mortality no doubt will be lessened.

Babcock's work (9) is perhaps the most notable recent communication. He employs it for an astonishingly wide range of cases. He notes that in toxic and greatly weakened conditions spinal anaesthesia is dangerous. He states that 50 per cent of patients who have had ether have headache as compared with 20 per cent after spinal anaesthesia. Boyd and Yount (18) have had an ex-

perience that entitles them to speak. In 6,229 cases they have had 4 deaths. They have mild headache and backache in 20 per cent of their cases and severe headache and vertigo in 1 per cent. They ascribe these severe cases to aseptic inflammation. The best remedy for this condition they have found to be repeated spinal puncture, removing from 10 to 25 ccm. at each sitting. Steel (129) finds that the headaches due to spinal anaesthesia yield to pilocarpine sweats. He thinks the withdrawal of cerebrospinal fluid makes the condition worse. Stanley (128) using tropococaine had headaches in 8 per cent and catheterization was required in 18 per cent. He places the patient in a Trendelenburg position of 10 or 12 degrees after using one and one-half grains of the drug dissolved in 25 minims of the spinal fluid. Deboyle (29) regards spinal anaesthesia as contra-indicated in young children, old age, recent syphilis, acute infections and febrile tuberculosis. Tuffier (136) thinks its use should be avoided in emotional subjects and in those suffering from medullary affections.

While most operators have been cautious in the use of spinal anaesthesia in conditions of great weakness, particularly in anæmic states, Huggins and Casleman (70) recommended it in general weakness of the cardiac muscle. They believe it allows the heart muscle to rest because dilatation of the splanchnic vessels during anaesthesia allows the blood to accumulate in this region, thereby causing a fall in the blood-pressure.

SACRAL ANAESTHESIA

In general this method has followed general lines laid down by the earlier writers. The disposition to use large amounts of a weaker solution proposed by Hertzler (62) is being generally followed. Lewis and Bartels (87) for instance advise the use of 30 to 90 ccm. of the solution. These authors introduce the term "caudal anaesthesia," an innovation not generally followed, due probably to a scarcity of caudal appendages that require anaesthetization. Pickens (102) also has found that large amounts of the weaker solutions give better results than small amounts of a stronger. He also found extremely corpulent patients are not good subjects for sacral anaesthesia. He now uses a stiletted spinal needle recommended by Harris. In six cases ether was required and in thirteen local anaesthesia had to be used as an adjuvant. In those which were successful anaesthesia was complete in from six to twenty minutes.

Smith and Porter (125) believe that the fall in blood-pressure following sacral anæsthesia is due to paralysis in the splanchnic region. They believe the fall is due more to the amount of drug used than to the site of injection. A greater fall in pressure occurred when adrenalin was used than when the novocaine was used alone. The findings of these authors is opposed to the findings of Gray and Porter (53) who believe the fall is due to general muscular relaxation.

LOCAL ANÆSTHETICS FOR THE CONTROL OF PAIN

A number of years ago alcohol was quite extensively used for the injection of inoperable carcinomata. The theory was that fibrous tissue growth was thus stimulated, the rate of growth thereby being limited. The use of this drug did limit the pain. Dyas (35) has again called attention to the use of this drug for the control of pain. Alcohol can be effectively used for neuralgias, notably in the trifacial variety, by making peripheral injections only. The second branch may be reached by injecting through the labial fold. Usually the foramen can be palpated with the needle. The third branch may be controlled by injecting it at its exit from the mental foramen. The patient is spared pain if novocaine, about one-half of one ccm., is first injected. Full strength grain alcohol is then used, receiving its dilution from the novocaine solution previously injected.

The use of injections for the control of neuralgias, notably sciatica, by the injection of salt solution about the nerve is not new. Hecht (60) reviewed the literature and presented his own results. Rosenheck and Finkelstein (110) in fifty cases got favorable results in only twenty per cent.

I regret to note that no paper has appeared on the use of quinine and urea hydrochloride for the cure of sciatica. This drug injected directly into the nerve or at least at the location of the nerve gives uniformly favorable results. The most convenient place for striking the nerve is where it passes over the neck of the femur. This bony structure gives reliable data as to the proper depth to which the needle must be passed. By successively changing the direction of the needle the nerve will be struck. The patient will indicate this event by the complaint of pain down the thigh or in the calf, sometimes even in the foot. I use four grains of the drug in an ounce of water. The patient should remain in bed a few days after the injection has been made. No fear of too extensive or permanent anæsthesia need be

feared. At most the patient states that the leg feels too short or feels as if it were made of wood. The relief of pain is hailed with so much gratitude that these sensations are heralded with joy. The injections are repeated in a week. Three or four usually are sufficient to complete a cure. I have not seen it fail even in the long standing cases where a compensating scoliosis has developed.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Stewart, F. T.: A Method of Gastro-Enterostomy. *Ann. Surg.*, Phila., 1917, lxxi, 334.

The author describes a method of his own for performing gastro-enterostomy without clamps. He maintains that it has no greater, and perhaps less, danger of leakage than when clamps are used. The other advantages claimed for it are chiefly that it is accompanied by less traumatism to tissues, is sure to be free from postoperative hemorrhage, and is more readily performed.

The author's method consists in inserting a celluloid suture through the stomach and intestine at each end of the sites chosen for the new communication. By keeping traction on these sutures, the jejunum and stomach are kept in close approximation. The usual posterior stitch is next introduced. The peritoneal cavity is then walled off and incisions made in both viscera close to the line of suture exposing the blood-vessels which, with a small bit of underlying mucous membrane, are not as yet severed. The blood-vessels, usually five or six in number, are doubly secured with hemostats and the mucosa opened between them. Taking first the posterior wall, each pair of vessels, one gastric and one intestinal, in the exposed edges is ligated with a single strand of chromic catgut, after drawing the edges together by means of the two forceps in closest proximity. These ligatures not only prevent any hemorrhage, but hold the edges of the mucosa in firm apposition.

The anterior edges are drawn together by beginning at the end farthest from the surgeon. The two forceps which lie opposite each other are held together by an assistant. The right end of the ligature is passed around the forceps on the intestine from right to left, the left end is passed around the forceps on the intestine from left to right so that the ends emerge between the forceps, beneath the loop of the ligature. The forceps are now brought parallel to the long axis of the wound, and rolled toward each other, inverting the mucous edges of the wound. Each succeeding pair of vessels is dealt with in the same way.

The rest of the procedure is much as in the usual operation. The seroseros suture which has already been inserted along the posterior side is continued along the anterior portion and tied at its point of origin. The location of the incisions in both the stomach and intestine is determined by

the usual rules laid down for gastro-enterostomy. Of the last 40 patients upon whom this operation was performed, 38 recovered without mishap, and two died, both of whom had inoperable carcinoma and succumbed to exhaustion and pneumonia on the sixth and seventh days. GATZWOOD.

Quain, E. P.: The Transverse Incision in the Upper Abdomen. *J. Lancet*, xxxvii, 657.

The author draws his conclusions from his experiences based upon 239 operations on the biliary tract, 34 upon the stomach and duodenum, 4 upon the right kidney, and 6 exploratory operations of the upper abdomen, all made through the transverse epigastric incision.

The appendix was removed through the same incision in over 30 per cent of the patients; a number of these operations were made in the presence of acute local infection and peritonitis, such as perforated gastric and duodenal ulcer, septic gall-bladder and duct and subhepatic abscesses.

Quain believes that the transverse incision has in no instance shown itself to be contra-indicated, even in the most septic condition. Only two patients have returned with any evidence of postoperative hernia. He believes that both the anatomy and the physiology of the abdominal wall are injured by cutting in a longitudinal rather than in a transverse direction, and that restoration to normal is impossible after many of the longitudinal incisions that are now in vogue. E. C. ROBITSHEK.

ASEPTIC AND ANTISEPTIC SURGERY

Brown, W. L.: What the European War has Taught in the Treatment of Wounds. *South. M. J.*, 1917, x, 809.

It is still too early to be able to reach conclusions derived from the observations of the eighty or more thousands of physicians stationed along the thousands of miles of battle front. In the present war the men are fighting in a territory which has been cultivated and fertilized for generations; the missiles are of a far more destructive type; so that practically every wound is infected, and the so-called "normal bullet wound" with its small entrance and exit wounds is almost unheard of. The first aid packet in common use in the English and French armies is of little use, because the wounds are too extensive.

The discussion between the one school headed by Wright who is opposed to chemical antiseptics and prefers the stimulation of the natural protective processes, and the other headed by Carrel and others who prefer antiseptics, has not been concluded. The majority of surgeons at the front, however, use the chemical antiseptics.

Abdominal wounds should be operated upon provided the patient is seen soon after the injury and provided a trained surgeon does the operating. The author suggests that a specially trained surgical personnel even under disadvantageous conditions can produce far better results than an untrained force fully equipped.

The two greatest dangers in war wounds, namely, tetanus and gas bacillus infection, have been very greatly reduced. The first has been practically eliminated by the routine use of antitoxin as part of the first aid procedure; and the second by means of early and free incision, excision of the devitalized tissues, removal of foreign bodies and bone fragments, and continuous chemical disinfection. The X-ray has been of invaluable assistance in the early diagnosis of gas infection, especially when the infection is subfascial.

R. B. BETTMAN.

Beck, H. M.: A Report of the Results of the Use of the Carrel-Dakin Solution in Mouth Surgery. *Dental Cosmos*, 1917, lxx, 974.

Beck recommends the use of the Carrel-Dakin solution as a germicide and mouth disinfectant, holding that it is more efficient, less irritating and less toxic than any antiseptic used heretofore. He advocates its usage in disinfecting the mucous membrane before hypodermic injections of novocaine-suprarenin and in the treatment of pyorrhoea.

M. N. FEDERSPIEL.

Gibson, C. L.: The Carrel Method of Treating Wounds. *Ann. Surg.*, Phila., 1917, lxxi, 262.

The author came in personal touch with Carrel and his method of treating wounds. He infers that ignorance of a method of treatment causes it to fall into disfavor. Many surgeons are using the Dakin solution without an understanding of its basic principles. Their results frequently are unsatisfactory, and the method is condemned.

The author reviews a part of "La Traitement des Plaies Infectées," by Carrel and Dehelly.

The properties of an antiseptic are to be considered from the standpoint of its irritating character, toxic power, solubility, capacity for penetration absorption, and its reaction with the proteins of the tissues. Dakin's hypochlorite of soda is a hypochlorite of soda modified to neutralize the free alkali which, when present, gives caustic properties. Hypochlorite solution combines with the proteins of the pus, and cannot be recovered as such. This is the reason why bacteria grow in a mixture of pus and hypochlorite solution. Therefore the solution must be applied continuously or intermittently.

When a wound is treated with the solution for a time, the bacteria disappear. Experiments were undertaken to determine if the sterilization is due to the Dakin solution. Tests were made with filter paper placed upon two areas of the infected wound. One piece of filter paper was treated with the hypochlorite solution while the other was treated with normal saline. After a few hours the bacteria disappeared from beneath the filter paper treated with hypochlorite, while in the other the bacteria were left unchanged and the parts appeared painful and angry. Similar results were obtained with deep wounds. Those areas upon the same extremity which were treated with the Dakin solution after a short time became painless, free from organisms, and showed a tendency to heal, while the other areas treated with dry dressings were painful, angry, and contained an unchanged number of bacteria. A quantity of pus was obtained from a grave case of tetanus; to one-half of this was added two parts of 1/100 hypochlorite solution, to the other an equal amount of .8 salt solution. At the end of an hour 1 ccm. of each was injected into guinea pigs. The one receiving the pus treated with hypochlorite survived, the other died of tetanus.

Hypochlorite is not toxic when used externally, but is dangerous when injected into the circulation because of its hemolytic properties. When applied to a wound it causes no irritation. Its action is more marked *in vitro* than *in vivo*. Non-vascularized tissue becomes dissolved. Clots plugging vessel walls become liquefied. It is important therefore to make careful hemostasis. Hypochlorite must come in contact with the organisms infecting the wound.

Topography of the infection was studied to determine the growth of bacteria in wounds. It has been demonstrated that at first, the organisms remain on the surface, that in the succeeding period of twenty-four to forty-eight hours bacteria develop in large numbers, penetrating the intramuscular spaces and the surrounding connective tissue. It is therefore necessary to begin early sterilization of wounds, and to remove all foreign particles, such as pieces of clothing, fragments of shells, etc. When the antiseptic solution was brought in contact with the infected surface, the number of bacteria rapidly diminished and the wound shortly became aseptic. Suppurative wounds were sterilized within twenty-four hours; those accompanied by compound fractures, in five or six days. It was difficult to bring the antiseptic in contact with the microbes in suppurating wounds.

The author outlines a technique of mechanically cleansing wounds before the administration of the antiseptic. Incision and cleansing of wounds should be undertaken with the utmost care, opening every fistulous tract, enlarging incisions, and removing all accessible traumatized necrotic tissue. Hemostasis must be carefully performed and the extraction of projectiles and fragments of

clothing must be thoroughly carried out. When complicated by a fracture, incisions must be made to explore and cleanse the fractured ends of the bone and to remove all loose spicules. All fragments adherent to the periosteum are preserved.

The following is the method used for the administration of the Dakin solution:

The wounds are filled with a large number of small rubber tubes to carry in the Dakin solution. Each tube is about the size of 16 French, perforated at the end with a number of small holes, and usually tied off at the open end to allow the fluid to run out of the smaller holes. The fluid is introduced at a pressure of 1 meter, and on account of the numerous holes of small size the fluid is forced out very much like a spray. Each tube is destined to spray a limited section of the wound, so a very large wound may require a dozen or more tubes. These tubes are coupled up by special branch tubes of glass which lead to the tank containing the Dakin solution over the patient's bed.

The dressings are applied largely in one piece and are made very light, the theory being not to have a big dressing into which the fluid simply accumulates. The Dakin fluid is admitted by releasing the stopcock of the irrigator and allowing a prescribed quantity of the fluid to flow out into the small tubes every two hours. The amount will vary according to the number of tubes and the size of the wound. The object is to keep the wound damp without flooding it, and the exact amount of fluid has to be studied by the typical condition of each wound and by experience. The fluid is somewhat irritating and it is wise to protect the skin with yellow vaseline. The wounds are dressed daily.

M. A. BERNSTEIN

Bashford, E. F.: Sterilization by Dakin's Solution and the Occurrence of Secondary Hemorrhage.
Lancet, Lond., 1917, cxviii, 595.

The present investigation had its origin in the question of whether or not secondary hemorrhage is more frequent under some forms of treatment than in others. It was suspected that the walls of healthy vessels lying exposed in wounds might be corroded by the antiseptic solution employed. The histological investigation of vessels from which secondary hemorrhage occurred has not lent support to this suspicion, since without exception such vessels were found to have suffered previous damage. In a few cases the damage was purely physical, and in one instance this physical injury was associated with an aseptic thrombosis. In most cases septic thrombosis was present. In others the bleeding point was surrounded by granulations, showing that corrosion was not the cause of the hemorrhage.

Experiments were made with chloramine, Dakin's solution, eusol, flavine, iodine, and mercury perchloride. The method adopted consisted in the immersion of living tadpoles in various dilutions of the substances to be tested, the experiments conducted at a temperature of 24° to 26° C.

The following observations were made:

1. By snipping off the tail some distance from the anus and dropping it into broth, it was first ascertained that the skin of the tails of tadpoles yielded a heavy growth of gram-positive and negative organisms, bacilli, streptococci and coliform bacilli, and were therefore suitable for this investigation.

2. The lethal concentrations of the several solutions for the tadpole were then determined, and the condition of the tail as regards sterility ascertained immediately after death, the nature of the lethal action being left out of consideration as immaterial.

3. When a minimum dilution sterilizing the skin of the tail at death had been found, a new series of experiments was made to ascertain if sterilization could be effected in non-lethal solutions.

4. Thereafter the minimum time required to sterilize the tails was ascertained and then was compared with the time required to cause the death of the animal.

5. Finally the corroding or digesting action of the several solutions on the abdominal wall was noted.

The author presents tables to show that Dakin's solution and eusol are practically parallel both in their lethal effects and in their power to sterilize living tissue, the latter action taking place in half the time required to produce death; but the solutions differ in their power to digest dead tissue.

Chloramine by comparison with Dakin's solution and eusol is shown to be relatively less toxic to the animal; and the minimum time which it requires to sterilize the tail is a much smaller fraction of the time required to kill the animal, or about one-fourth of the time required by other substances.

Flavine has not the same power to sterilize the skin of the tail, sterilization having been obtained but once at death by a dilution of 1 to 2,000. Iodine and mercury perchloride have only been tested for the purposes of control.

As the question of the corroding action of Dakin's solution on the walls of healthy vessels has been raised in connection with secondary hemorrhage, the digestive power of this solution was tested on the abdominal wall of tadpoles. One dead tadpole and another live one were put in Dakin's solution in dilutions of 1:1,000; 1:2,000 and 1:4,000. The abdominal wall of the dead tadpole was digested in these solutions in 30 minutes, 2½ hours, 3 hours and 40 minutes respectively. The abdominal wall of the live tadpole was digested in these solutions in 40 minutes, 3 hours, 3 hours and 55 minutes respectively.

It would appear that the local action of Dakin's solution was held in check by an efficient circulation, either by providing protein-containing fluid or by carrying off and rendering harmless the hypochlorites as they approach living tissue without entering into combination with them. The author thinks that his experiments are an expression of the limited extent to which Dakin's solution can injure living tissue in the presence of an efficient circulation.

Were the erosion of sound vessels the usual cause

of secondary hemorrhage this accident would occur in practically all cases. Part of the frequency of secondary hemorrhages may be due to improper application of the solution by pressure of the point of the Carrel tube.

V. C. HUST.

Dakin, H. D., Lee, W. E., Sweet, J. E., Hendrix, B. M., and LeConte, R. G.: Dichloramin-T in the Treatment of Infected Wounds. *J. Am. M. Ass.*, 1917, lxi, 27.

Lister first applied the principles of Pasteur in search for the perfect germicide, one that will kill pathogenic bacteria while causing no harm to cells of the living body. The lethal effect of germicides on the body cells, with the retardation and inhibition of the natural processes of repair, are well known and surgeons have relied somewhat upon soap, water, and alcohol, but chiefly on the natural bacterial resistance of the patient.

New demands are made on surgeons by the extensive suppurative wounds of modern warfare and a further search for an agent which would meet the long desired object has been effectively made. In military surgery the problem has not been the prevention of infection but one of treating infection.

Dakin's chlorin-containing solution must be made with extreme care else it irritates the skin if left in contact for any length of time.

In the Dakin-Carrel-Doherty-DePage technique a constant immersion of all the wound surfaces is maintained; and when carried out in the minutest detail the experience of the writers has shown that infected wounds can be sterilized in a remarkably short time. While not minimizing the wonderful results obtained by this treatment, it is true that the technique requires more painstaking care, and consumes more time in carrying out the treatment and that the solution is much more irritating to the skin than the dichloramin-T, while the results from the latter are just as good.

The technique of preparing and applying the dichloramin-T is much more simple, and the skin irritant quality is eliminated. It is chlorinated oil of 5 to 10 per cent strength from which the germicide is slowly liberated over a period of from eighteen to twenty-four hours instead of thirty minutes to one hour as with the hypochlorite solution. To use the dichloramin-T treatment the wound if superficial is covered by the oil, and if deep, the cavity is filled, and needs to be replaced only once each twenty-four hours; the wound is covered with a few layers of gauze to avoid absorption of the oil.

"If we had only obtained as good results from this method as from the hypochlorites, the simplicity of the technique and the saving of dressing material would have insured its replacing the former method."

F. P. HAMMOND.

Fansler, W. A.: The Use of *Bacillus Lactis Bulgaricus* in the Treatment of Infected Wounds. *J. Lancet*, 1917, xlii, 670.

There are two main types of lactic acid-producing bacilli designated as Type A and Type B. Type A

is used, since it produces approximately twice the amount of lactic acid as Type B. The strongly acid reaction produced by these bacilli makes them serviceable in infected wounds. Fansler states that they have been used with success in a number of types of wounds, including one case of hand infection, one case of empyema, one infected cyst of the face, and a large series of abdominal cases. The liquid culture is now used because it is more convenient and more potent than the dissolved tablets.

The wound is first irrigated with sterile water and the surplus fluid soaked up with gauze; then the culture is poured or injected directly into the wound. By the third day the discharge is greatly reduced and in five to seven days will have ceased almost completely. No chemical antiseptic is used, as the organism is easily killed. The wound granulates and heals rapidly.

The advantages which this method possesses over antiseptic solutions are, first, that there is a therapeutic agent of increasing strength constantly in the wound, while an antiseptic solution is soon diluted with the wound secretions and rendered ineffective; second, since the Bulgarian bacillus is present constantly, deeper penetration is obtained than in short irrigation; third, it is not destructive or toxic in any concentration, and may be readily destroyed if desired; fourth, it has the advantage over antiseptic powders of deeper penetration and of allowing free drainage; fifth, it is painless.

The author does not advise this treatment for all infected wounds, but advances it as an easily applied and valuable therapeutic agent.

CARL R. STEINKE

Tanner, R.: A Note on the Germicidal Power of Flavine. *Lancet*, Lond., 1917, cxlii, 493.

Browning and his co-workers claim that in flavine there is afforded a germicide which is very potent and which is more active in the presence of serum than in peptone water. For the staphylococcus flavine is stated to be germicidal in 24 to 48 hours at 37° C. in a strength of 1:20,000 in peptone water and 1:200,000 in serum. Flavine is also stated to possess low inhibitory power on phagocytosis.

In the Browning technique a very small number of organisms is the subject of the test; to the author's mind this is a fallacious method of testing. He states that in all disinfectant experiments a volume containing hundreds if not thousands of organisms should be subcultured because the destruction of bacteria by a germicide follows the course of a logarithmic curve, there being an enormous destruction of organisms at an early stage, but a small number surviving for some time.

It is stated that flavine has an increased germicidal power in serum and the inference is drawn that a similar potency exists upon organisms in pus. Serum is a poor culture medium for organisms, while the purulent discharge of a wound may be swarming with organisms.

The germicidal action of flavine is so slowly

exerted that Browning adopted not less than 24 hours' contact in his experiments, and the author questions whether such a slowly acting germicide is going to supersede germicides which, even if less potent, act more quickly.

To ascertain the toxicity of flavine for leucocytes Browning incubated a mixture of flavine, serum, and leucocytes for 20 minutes. The author thinks no inference is justifiable, as the test for toxicity upon bacteria was for 24 hours, and it might be similarly slow for leucocytes.

The author's experiments resulted as follows:

1. *Bacillus perfringens*. A similar quantity of dust was placed into each of 8 test tubes. Recently boiled milk and flavine were added and the tubes heated to 86° C. for 15 minutes, and incubated anaerobically for 3 days. From this experiment the author shows that in a highly albuminous medium the inhibitory power of flavine upon the development of organisms of the *Bacillus perfringens* group lies between 1:4,000 and 1:10,000.

2. *Staphylococcus* in broth. Five ccm. of broth were inoculated with 0.05 ccm. of a 24 hour broth culture of *staphylococcus aureus* and flavine added. The mixtures were incubated at 37° C. and 0.1 ccm. subcultured into the broth after 9 hours and 24 hours. This experiment showed the germicidal power of flavine on *staphylococcus* to lie between 1:5,000 and 1:10,000 for a 9-hour exposure, and 1:10,000 and 1:100,000 for a 24-hour exposure.

3. A similar experiment on *staphylococcus* in saline was made with the same results.

4. An experiment with *staphylococcus* in saline containing a larger number of organisms than in experiments 2 and 3, i.e., 4,000,000 cocci per ccm., showed the germicidal power of flavine to lie between 1:2,000 and 1:4,000.

5. An experiment upon human serum containing 0.05 of broth culture of *staphylococcus* showed the germicidal power of flavine to lie between 1:15,000 and 1:20,000.

6. *Staphylococcus* in pus. The pus was of a purely *staphylococcic* nature from an abscess of the neck. With 1 ccm. of pus was mixed 1 ccm. of the flavine solution, and after incubation loopfuls were sown upon agar and into broth. Here even 1:200 flavine did not completely kill the *staphylococcus* in the pus, judging from the agar subculture; and in the broth subcultures the germicidal strength lay between 1:200 and 1:1,000.

From these experiments the germicidal power of flavine appears to be much lower than that stated by Browning and his co-workers. The results with pus are poor and many disinfectants equal or surpass flavine and have the advantage of much more rapid action.

V. C. HUNT.

Stewart, D. H.: Bipping of "Blackamithing." *Med. & Surg.*, 1917, 1, 838.

Bipping is derived from "bipp," a paste composed of one part of bismuth, two parts of iodoform and one part of liquid paraffin, all well triturated and

grit-free. The tissues are thoroughly rubbed with this and the wound is filled with it. Drainage tubes are not required, and when the tightened sutures squeeze the opposite walls of the wound together, any great excess of paste upon the skin may be wiped away. The bandage is applied as usual and left for two weeks. After its removal, the smear may be washed away with a grain to the ounce of iodine and alcohol.

After citing a case from Morison's article on "The Treatment of Infected Suppurating War Wounds," Stewart discusses the subject of fistulous tracts from metal screws used with metal bone plates. There may be as many of these tracts as there are screws; the skin openings may be discrete; but an injection of colored paraffin oil will reveal along the upper surface of the plate a dead space or lacuna that unites two or more of these tracts. Wherever there is such a dead space, though it be but the depth of the notch upon the head of the screw, there is a possible reservoir for a stream of septic flow. In its power of filling gaps and pits, bipp is ideal.

Stewart makes two suggestions: (1) the use of bipp when the plates are placed; (2) when a fistulous tract has formed, the employment of a long incision, exposure of the plate and the application of bipp.

P. G. SKILLERN, JR.

ANÆSTHETICS

King, E. L.: Nitrous Oxide-Oxygen Anæsthesia. *Med. & Surg.*, 1917, 1, 843.

The author's report is based upon experience in 1,000 operations, ranging from curettage and extraction of teeth to major abdominal procedures, such as cholecystectomy, cholecystenterostomy, gastro-enterostomy, etc. All the operations were preceded by morphine and atropine.

The advantages and disadvantages of this anæsthetic are detailed. Caine's apparatus is pictured and described: this device transfers gas and oxygen from large to small cylinders, thus reducing the cost from that when the gas is taken primarily from the small cylinders. The author has used Crile's anoci-association technique with great satisfaction to himself and benefit to the patients. In abdominal work he has found it essential to adhere rigidly to the originator's technique.

In order to obtain the best results in the use of gas it is essential that: (1) the operator be accustomed to this anæsthetic; (2) that the administrator know the limitations of gas as well as its advantages; (3) that the patient be properly prepared; and (4) that the operation to be performed be suited to the anæsthetic.

P. G. SKILLERN, JR.

Page, H. M., and White, G. B. M.: Ether-Oil Anæsthesia by the Rectum. *Lancet*, Lond., 1917, *caulil*, 643.

The apparatus required is very simple: an india rubber catheter, a funnel, a medicine measure, an

empty medicine bottle with a cork for shaking the mixture; this shaking must be done forcibly for two minutes.

A simple cleansing of the bowel an hour or two before the injection in addition to the usual dose of medicine is an advantage. One-fourth of a grain of morphia and one-hundredth of a grain of atropin is given half an hour before the ether oil injection. From twenty to twenty-five minutes before the time of operation six ounces of a mixture of two parts of ether and one part of oil are slowly administered by the rectum, six minutes being spent in making this injection; the catheter is passed three or four inches into the rectum. When the operation is finished the remaining ether-oil must be washed out, using a large rectal tube and funnel. The washing is continued until no ether or oil can be detected in the returning fluid. Before withdrawing the tube three ounces of olive oil are passed into the rectum and left there.

The author states that in following this technique there have been no rectal, pulmonary, nor gastric sequelae. The return of consciousness is not delayed when the washing out is done satisfactorily. The author has used this method of anesthesia in 47 cases; all recovered from the operation except two cases of laminectomy who died of an ascending myelitis. In two of the earlier cases in which a 75 per cent solution of ether was used, there was rectal irritation, mucus and a slight trace of blood lasting a day or two. In another case there was looseness of the bowel for a few days. The author since has used a 2 to 1 solution. There is no complaint of pain during injection when a 2 to 1 solution is used.

V. C. HUNT.

Zabrocki, J. A.: Practical and Efficient Methods of Anesthesia. *Dental Cosmos*, 1917, LV, 993.

Zabrocki condemns the open drop ether method as a crude and unscientific method, and holds it responsible for all the ill-repute that ether bears today, especially as regards nausea and vomiting. It is irregular and uneven, with a tendency to acidosis. He also condemns the so-called nitrous oxide-ether as a more dangerous method, since it has a tendency to raise the blood-pressure enormously, to make the patient cyanotic, and is responsible for many deaths.

Zabrocki advocates oil-ether anesthesia for neurotics and in all operations upon the respiratory tract, head, neck, mouth, jaws, chest, tonsils, and for goiter and adenoids. Oil-ether anesthesia is contra-indicated in all pathological conditions of the lower bowel, such as colitis, hemorrhoids, ulcers, fistula and in emergency cases.

The advantages of oil-ether anesthesia are the prevention of shock, narcosis of smooth and uniform depth, and nearly normal pulse and respiration. There is little or no change in blood-pressure; the reflexes are not disturbed; hypersecretion of mucus is absent; there is less hemorrhage in mouth, head and neck surgery.

Nitrous oxide and oxygen anesthesia he considers the luxury of all inhalation anesthetics. It has proved to be 100 per cent efficient. By this means it is possible to anesthetize all patients in any form of surgical operation.

M. S. FRIEDBERG.

SURGICAL INSTRUMENTS AND APPARATUS

Campbell, J.: A Splint for the Treatment of Gunshot Wounds Involving the Shoulder-Joint. *Brit. M. J.*, 1917, II, 426.

The treatment in a base hospital in France of a large number of gunshot wounds involving the shoulder joint has impressed the author, first, with the great necessity for securing adequate rest and fixation combined with extension; and secondly, the absence of any useful method for attaining this. Accordingly the idea suggested itself that a splint made after the principle of a Jones abduction frame for the lower limb would prove useful in such cases.

After the use of such a splint in several instances he is quite convinced of its efficacy. The author has found that the patient can be easily cared for and the dressings changed without pain or discomfort. Furthermore, patients can be transported in it with ease.

After the period of acute sepsis subsided, the cases were put in plaster with the limb still in the abducted position, but with the elbow flexed, and holes were cut in the plaster to permit access to the wounds. The cases were then sent to England.

P. G. SKILLERS, JR.

Osgood, R. B.: Adaptation of the Thomas and Jones Splints to Obtain Fixation of the Arm in an Abducted Position While the Patient is Ambulatory. *Brit. M. J.*, 1917, II, 477.

The war has demonstrated quite clearly that the ring and wire splints of Thomas and those which Sir Robert Jones has devised are wellnigh universally adaptable. As surgeons become familiar with their use and appreciate the soundness of their simple mechanical principles, they are becoming more and more the method of choice, and the results obtained are becoming more perfect.

The principle of extension by traction and counter-pressure makes of these splints a unit apparatus which provides easy and comfortable transportation, and allows the detailed treatment in the base and home hospital to be continued with complete satisfaction without change of the apparatus, which may be and now usually is applied at the casualty clearing station or even at the dressing station. Their comparative cheapness of manufacture, their small bulk and easy packing are other advantages possessed to the same degree by no other splints with which the author is familiar. He questions the wisdom of devising other forms of splints at the present time, since the benefits of unit construction and universal use are so obvious that it seems rather that all surgeons should train themselves in their use; nor is that training difficult.

Many orthopedic surgeons have been accustomed to use plaster of Paris and feel that equally good results may be obtained with these dressings in combination with metal or plaster bridges. These bulky casts should be abandoned; they are time-consuming in application, and demand the acquirement of a certain specialized technique.

In fractures of the head or neck of the humerus and in injuries to the bones or muscles of the shoulder girdle the author has been impressed with the value of fixation with extension in the abducted position. In his experience there are a surprisingly large number of these injuries. Not only may better alignment and more speedy subsidence of the septic process be gained by the abduction, but the comfort of the patient seems greater in this position. There can be no doubt that future function also is favored. As Jones has pointed out, even a stiff shoulder with the arm in 60 degrees of abduction provides a surprisingly useful limb. As soon as the septic process begins to subside and the fever is under control, ambulatory treatment increases the resistance of the patient and greatly simplifies the cure.

The suggestions made by the author are in no way modifications of these splints, but merely adaptations which may be found to increase their usefulness. Sufficient trial has been given in the

wards and in transport to England to seem to prove their practicability. Many other adaptations may easily be made.

P. G. SKILLERN, JR.

Fiddian, J. V.: A Pneumatic Tourniquet for Amputations and Other Purposes. *Lancet*, Lond., 1917, cxciii, 648.

This tourniquet has the advantages that it is easily sterilized and can be easily controlled by an anesthetist standing at the head of the patient.

The tourniquet consists of a rubber bag two inches wide and some twenty inches in length. Halfway along one edge of the bag is inserted the inlet tube in T-fashion. The inlet tube is four feet long and ends in a stout bulb which is fitted with a valve and a simple spring clip.

The bag is fitted in a cover which may be sterilized and has a leaden back to prevent rolling when distended. In use the bag is wrapped around the limb, the inlet tube passing toward the head. A two and one-half inch linen bandage is then firmly applied over the tourniquet and the bag inflated till the distal pulse disappears.

In operating upon patients with brittle arteries, less damage will be done by this tourniquet than by any other, because the pressure is just sufficient to compress the artery and can be released immediately after the artery is tied.

V. C. HUNT.

SURGERY OF THE HEAD AND NECK

HEAD

Daudin-Clavaud, H.: Facial Paralysis Consecutive to War Wounds (Contribution à l'étude des paralysies faciales consécutives aux blessures de guerre). *Thèse de doct.*, Bordeaux, 1917.

Seventeen cases of facial paralysis consecutive to war wounds have been treated surgically by Moure according to a new procedure. The report deals only with paralysis consecutive to a lesion of the facial nerve in the fallopian aqueduct or in the parotid region. The facial nerve may be primarily injured by a traumatism, or secondarily as the result of infection; it may be the only nerve injured or it may be associated with injuries of other nerves. Bilateral section of the seventh pair is exceptional.

In the presence of a war facial paralysis it is of the highest importance that the surgeon should precisely locate the site of the injury of the nerve, also the exact type of lesion, whether a neuritis, a compression, or a complete or incomplete section.

Paralysis with a parotidean location is less serious than in an intrapetrous location; and among these latter the least grave are those which involve the nerve in the second or third part of the fallopian aqueduct.

Surgical intervention should be as early as possi-

ble and is contra-indicated in only one case, viz., hemiatrophy of the face.

In the case of paralysis of the facial nerve in the parotid region, the cicatrized surfaces must be opened, all thick cicatricial tissue which separates the lips of the wound removed and formation of such new tissue suppressed. If the nerve filaments are sectioned, the two ends should be juxtaposed. If the ends cannot be found, operation should be confined to approximating and suturing the deep lips of the wound.

In paralysis of the facial nerve in the fallopian aqueduct, one must proceed as in a radical cure by enlarging the tympanomastoid canal to the maximum, so that the bony portion of the fallopian aqueduct is fully exposed. The thin piece of bone covering the nerve is lifted up with a gouge. The nerve should then be followed from above downward, and any morbid alterations found are corrected. The intervention is very delicate and requires cleverness and facility, and should be undertaken only by one thoroughly familiar with the surgery of the region. The lesions of war are atypical and the alterations are numerous.

The results obtained by Moure are excellent. In 12 operations there were 6 recoveries and the other 6 recently operated upon promise at least 4 more successful recoveries.

W. A. BRENNAN.

Mixer, W. J.: *Fractures of the Base of the Skull at the Massachusetts General Hospital. Boston M. & S. J., 1917, clxxv, 518.*

The author collected all the cases of proven or practically certain fractures of the base of the skull occurring from 1800 to 1917. He then eliminated those cases in which operation could not be considered, and also those in which the patient died from multiple injuries within two hours after his entrance to the hospital, thus leaving only the early cases of fracture of the base.

By operation the author includes only those surgical procedures which have a decompressive effect. The author's total number of cases was 301, with a total of 163 deaths or a mortality of 54.1 per cent. There were 209 cases treated expectantly, with 123 deaths, a mortality rate of 58.3 per cent. There were 92 cases operated upon with 40 deaths, a mortality rate of 43.4 per cent. The total number of cases operated upon therefore was 30.6 per cent.

Between 1800 and 1900 there were 101 cases; 9 per cent of these were operated upon, with a mortality of 67 per cent. From 1900 to 1911, there were 196 cases; 23 per cent of these were operated upon, with a mortality of 51 per cent. From 1911 to 1917, there were 74 cases; 71.5 per cent of these were operated upon, with a mortality of 36.5 per cent.

There were 7 instances of proven meningitis without operation, and 1 with operation. Proven intracranial hemorrhage without definite localizing signs occurred 42 times; with definite localizing signs, 19 times. Operations performed within two days of the time of injury numbered 85, with a mortality of 41.2 per cent. Operations performed more than two days from time of injury numbered 7, with a mortality of 71 per cent.

The author calls attention especially to the relative high mortality in late operations. Among his statistics massive hemorrhages were also found at autopsy or operation in 61 cases. Sixty per cent of this number showed indefinite or no localizing neurologic symptoms.

In such conditions a right subtemporal decompression is performed for the reason that this area is a silent one and uncovers that portion of the base most frequently injured, the middle meningeal artery. It permits thorough exploration of that portion of the skull and brain. The left-sided subtemporal decompression uncovers the speech center, and a traumatism or pressure is liable to cause a paralysis of the power of speech. The author advises early decompression in proper cases of fracture of the base of the skull. L. H. HILLS.

Christopherson, J. B., and Chalmers, A. J.: *Fractured Base of the Skull: the Subsequent History of a Case and Its Termination Twenty-Four Years After the Accident. Lancet, Lond., 1917, cxviii, 493.*

In March, 1917, the authors saw the patient, a man of sixty-five, who complained of discomfort below the occipital region of the head. He had a

temperature of 101° F. He became unconscious and apoplectic the next day, and never regained consciousness. The only additional symptom was inequality of the pupils, the right being fixed. Death occurred 84 hours after illness began.

Nearly twenty-four years previously he received a fracture of the skull; he remained unconscious for twelve weeks, finally recovering but with the loss of taste and smell. He appeared to recover completely, except that any worry or exertion caused his head to ache. This, however, was relieved by rest in bed and the administration of aspirin.

At postmortem a small abscess, the size of a thumb nail, was discovered in the frontal lobe. The pathologists report that "sections of the frontal lobe of the brain contained Gram-positive diplococci in chains, some of them having Gram-negative elements." These diplococci, separate and in chains, have been found several times in the Anglo-Egyptian Soudan. E. C. ROBERTSON.

Courtney, J. W.: *The Temperature as a Valuable Guide to Diagnosis, Prognosis, and Surgical Treatment in Cranio-cerebral Traumatism. Boston M. & S. J., 1917, clxxv, 511.*

In diagnosing cranio-cerebral traumatism the author considers the most important sign the associated temperature, because of the fact that neurologic symptoms are often confusing and not clear-cut. A pial edema may often cause the same neurologic symptoms as hemorrhage from the middle meningeal artery, and a contusion may vary from the slightest injury to the point of rupture of the brain itself.

In uncomplicated intracranial hemorrhage there is immediate shock associated with subnormal temperature, followed by a slight rise of not more than one degree, this temperature usually persisting throughout the course of the case. On the other hand, in uncomplicated contusion the temperature usually rises quickly from subnormal to as high as 102°, followed by marked remissions of two or three degrees in the morning, to be followed again by another rise in the evening, temperature gradually coming down to normal in favorable cases. In brain lacerations the rise is usually not so rapid but is much higher, and the author considers a persistent high temperature a positive indication of lacerated brain following cranio-cerebral traumatism.

In considering the complications of intracranial injuries he calls attention to the chills, which are not uncommonly present in simple contusion and do not in any sense denote pus formation; in arachnitis they are usually absent. A sudden jump in temperature several days after trauma accompanied by signs of cortical irritation, such as delirium, restlessness, etc., usually denotes an arachnoid process. The average temperature may be as high as 103° with frequent, often hourly, fluctuations.

The temperature of a cerebral abscess may be normal or subnormal even after the abscess has

developed to proportions sufficient to cause local manifestations. However, this is not constant; following an antecedent process the abscess may develop before the activity of this process has disappeared, in which event the temperature may remain high throughout.

The author offers these facts as a practical working basis sufficiently constant to guide in a diagnosis and in prognosis and treatment. L. H. HILLS.

Derache, P.: Trepanation in Cases of Gunshot Injury of the Cranial Vault (Note sur le devenir des trepanés d'après l'observation de cas de blessure de la voûte par projectile de guerre). *Bull. et mem. Soc. de chir. de Par.*, 1917, xlvi, 1754.

Of 165 injuries of the cranial vault reaching the author's ambulance within a period of two years, 27 died immediately without emerging from a state of coma. Of the remaining 78 cases in which surgical intervention offered some chance of success, 3 died from causes not attributable to the cranial injury. In 74 cases there was a primary trepanation. These cases composed 21 closed meninges; 38 open meninges without retained intracerebral projectile; 15 open meninges with non-extracted intracerebral projectile. In the latter cases the projectile was too deeply embedded to be extracted. In the 74 cases there were 15 deaths within one month, 4 being due to cerebral abscess and 10 to meningitis.

During the following seven months there were 7 more deaths, 5 due to cerebral abscess. There were 9 cases of precocious epilepsy mostly jacksonian in type; 12 cases developed a free cerebral hernia, 8 of which died. Where a hernia develops the prognosis is especially grave, particularly if there is a retained projectile. There were 52 survivals after the eighth month and there have been no further deaths. Forty of these cases date from one and one half to two and one-fourth years after operation. The 52 survivals comprise: 16 closed meninges; 19 open meninges without retained projectile; 15 intracerebral projectile cases. The author draws particular attention to the long tolerance of deeply embedded intracerebral projectiles.

The author gives the final mortality results with prolonged survival as follows:

In cases with closed meninges, 0 per cent; in cases with open meninges and retained projectile, 35.9 per cent; with intercerebral projectile, 60 per cent.

Surgical treatment has resulted in prolonged survival of more than 60 per cent of the cases operated. Neurological examination of the survivals show that in the cases with closed meninges 22.2 per cent and in the cases with open meninges 13.3 per cent are absolutely normal. W. A. BRENNAN.

Fracassi, T.: Serous Encysted Meningitis of the Posterior Cerebral Fossa; Operation; Recovery (Meningitis serosa enquistado de la fosa cerebral posterior; operación; curación). *Rev. méd. d. Rosario*, 1917, vii, 288.

The case reported by the author occurred in a woman of 26 years and apparently originated after

an experience of intense emotion which caused an endocranial hypertension. From the symptoms a tumor of the left posterior cerebral fossa was diagnosed, the nature not specific.

A trepanation was done following Krause's technique and the dura exposed. As punctures were negative, it was decided to incise the dura on the affected side. No alterations could be observed in the aspect or consistency of the cerebellar superficies. The hemisphere was explored with the index finger. Toward the anterior face an encysted collection was opened and citrinous contents of about 20 to 30 ccm. withdrawn. Suture and closure followed further exploration. The postoperative course was uneventful. All symptoms of endocranial hypertension, cephalgia, vertigo, etc., disappeared. The patient was up after fifteen days. Four months later she was seen and was in perfect health. W. A. BRENNAN.

Villandre, C.: Deep Abscesses of the Brain Secondary to Cranial Wounds (Abscess profonds du cerveau secondaires à des plaies du crâne.) *Lyon méd.*, 1917, cxxvi, 420.

The study of three cases of previous cranial gunshot injuries with late abscess formation has shown Villandre that cellular brain abscesses set up a reactive defense process such that the infected part of a ventricle becomes completely isolated from the rest of the cavity. The lateral ventricles seem to defend themselves from slow infections as well as from very neighboring abscesses.

The three cases are striking examples of latent microbism susceptible to sudden activity in old cranio-encephalic wounds suppurred for a long time through fistulization. In one of the cases the agent was the streptococcus and in the other two the staphylococcus.

Surgical treatment in these cases being particularly difficult, the author was confined to preventive and disinfecting procedures. This comprised filiform drainage and repeated evacuatory cerebral punctures. One of the patients died, the other two are in process of recovery.

The author draws attention to the necessity of early and thorough disinfection of cranial injuries to prevent formation of fistulae, and also to the requisite supervision of such injuries for a long period. W. A. BRENNAN.

Andrews, E. W.: Hemangioma of the Brain Inoperable by Ordinary Methods, Treated by Boiling Water Injections and Hot Metal Point. *Surg. Clin. Chicago*, 1917, i, 965.

The patient, a woman 44 years old, had well-marked focal symptoms referable to the right Rolandic area, papillitis, optic atrophy, and slight seizures pointing unmistakably to brain tumor. There was paresis in the face, arm, hand, and leg of the opposite side and progressively increasing headache and loss of vision.

The large parietal plastic flap made over the

affected area disclosed a slightly discolored outer table of the skull, and bluish vessels showing through the thin bone in an unusual way. The first trephine opening exposed pulsating veins of the diploe and had to be sealed with Hershey's wax. The trephine was then placed at an adjacent point, and on slight pressure broke through the thinned outer table, opening large sinuses which seemed part of a hemangioma occupying the place of the inner table, diploe and meninges to an unknown depth. The bleeding was arterial in strong pulsations and had to be held by pressure.

The outer wound was tamponed with bits of catgut and little grafts of the patient's muscle, which controlled the bleeding without great pressure. Subsequently boiling water in 1 to 4 ccm. charges was injected, puncturing the scalp and thin bone with a stout needle. After a few daily repetitions of this injection, the patient was again operated upon. The external carotid was ligated and on re-opening the wound, a very bloodless scalp and pericranium was found, but no cessation of the pulsation in the vascular mass. This demonstrated that its blood-supply came from some deep connection with the cerebral vessels and made free dissection unsafe. Doubtless in such a cavity bleeding could be stopped by packing against the bony margins, but at the cost of producing an intracranial hematoma of dangerous extent.

Large cautery points of heated copper were used, the ordinary soldering irons of the tinsmith; they were pressed firmly against the bleeding masses after the old horseshoe-shaped flaps were reflected by removing the stitches of the first operation. This caused wide and deep coagulation, although not entirely checking the bleeding. Bone, pericranium, and probably the dura and a certain layer of deeper tissue were devitalized but not charred, the irons being of a dull and not a glowing heat. Over the eschar the pericranial flap was again sewed.

Primary union took place with no drainage and no delay in clean healing. The immediate relief from this treatment was very marked. There was no increase of paralysis; rather, a decided improvement set in. The eye-grounds cleared remarkably. As to the end-result, a most conservative prognosis is advisable.

EDWARD L. CORNELL.

Roger, H.: Influence of Compression and Cerebral Emboli on the Blood-Pressure (*Influence des compressions et des embolies cérébrales sur la pression sanguine*). *Arch. de méd. expér., Par.*, 1917, XXVII, 591.

Experimental research on rabbits and dogs made by Roger lead him to conclude that cerebral emboli produce very marked changes in the arterial pressure. There is at first a slight lowering of the pressure, soon followed by an elevation. It is shown in different organs and especially in the suprarenal capsules. Illustrated tracings are shown.

The author made special research in order to discover if superactivity of the suprarenal capsule

was concerned in the hypertension. Rabbits were used, and the suprarenal capsules removed. In such decapsulated animals there is a temporary elevation. After about 56 seconds the pressure returns to normal and then continues to fall until about a 3 per cent depression is obtained. During this latter period there are crises of unilateral convulsions, with passing slight elevations of the pressure. The importance of the suprarenal capsules in maintaining the arterial pressure consecutive to cerebral emboli is observed by comparison of the various tracings.

The author thinks that the clinical deductions to be drawn from his conclusions are that variations in the blood-pressure of patients attacked by cerebral lesions should be looked for. These permit a differentiation between apoplexy and shock; they make evident the intervention of the suprarenal capsules in maintaining hypertension in the course of apoplexy.

W. A. BESSNER.

Sharpe, W., and Farrell, B. P.: Cerebral Spastic Paralysis Due to Hemorrhage: a Further Report of the First Sixty-Five Cases of Cranial Decompression for Selected Cases. *J. Am. M. Ass.*, 1917, LIX, 1056.

The patients were carefully selected, only those with signs of persistent intracranial pressure being chosen; these constituted less than 25 per cent of the cases examined. Ophthalmoscopic examination revealed dilated retinal veins and blurring of the optic disks; in the later cases, these findings of increased pressure were confirmed by the measurement of the cerebrospinal fluid at lumbar puncture by the use of the spinal mercurial manometer. In all cases there was a history of prolonged and difficult labor at birth, most of them being instrumental deliveries. A negative Wassermann of both blood and spinal fluid was obtained in every case except one. No selection was made as to age, spasticity, or mental deficiency. Microcephalic children, cases of agnesia, and those due to meningo-encephalitis were naturally excluded as nonoperable, there being no increased intracranial pressure.

The pathologic condition, as found at operation and postmortem, was noted. A definite fibrous cystic formation was invariably present. This lesion was supracortical in all but four cases, the others being subcortical or cortical. The cysts were punctured and their outer walls removed, fibrous formation was removed except in cases in which its removal would have caused damage to the underlying tissue; in these cases it was left alone.

After-treatment consisted in the correction of deformities by tendon lengthenings, stretching of muscles, tendon transplants, etc., massage, and careful muscle education with special attention toward establishing an improved co-ordination.

Of the 65 patients, 9 died after operation, and 8 have died in the past two years, making a total of 17 deaths. The authors have been unable to obtain any record of 4 patients; 19 show practically

no change, 25 show improvement more or less marked. The youngest patient was two and one-half years of age, and the oldest seventeen years.

When epilepsy is a complicating factor, the prognosis is invariably bad. The immediate results were gratifying in that the convulsive seizures were less frequent, but this improvement lasted only for a few months. The younger the child, generally speaking, the more marked has been the improvement. The older the child, the less marked the improvement. In the adult cases there has been practically no improvement. Supracortical lesions are the only favorable cases; in this type damage to the nerve cells is due to pressure alone from the overlying lesion. In the cortical or subcortical lesions, there is, naturally, a definite destruction of brain tissue, and only in those cells along the edges of the cyst that are suffering from pressure can any improvement be expected.

The authors make an appeal for better preventive means in avoiding this condition. First, more care on the part of the obstetrician is needed; careful pelvic measurements should be made as early as possible; prolonged labor should be avoided whenever possible; practitioners should realize that caesarean section is less dangerous to mother and child than is the use of the high forceps; during the first few weeks of life every child should be as carefully inspected for symptoms and signs of intracranial hemorrhage as for deformities. When these symptoms and signs are present, cranial decompression should be performed as early as possible in those selected cases in which the fluid or clotted blood can be removed before any or little permanent damage to the brain tissue has taken place.

In this manner the writers believe that the number of children suffering from this form of spastic paralysis can be reduced, and that the most severe cases can be prevented or improved. The essential points to be emphasized are the early diagnosis and early treatment of these selected cases. Nine of these infants have been operated upon the day after birth, with excellent results.

P. G. SKILLERN, JR.

Willems and Albert: Lumbar Puncture in War Surgery (La ponction lombaire en chirurgie de guerre). *Bull. et mem. Soc. de chir. de Par.*, 1917, xlin, 1780.

The author thinks that lumbar puncture is not used in war surgery as much as it deserves. It has given excellent results in craniocerebral lesions and their complications.

In cranial traumatism without external wound, puncture will tell whether there is only a simple concussion or a basal fracture. When there is a post-traumatic syndrome of vertigo, headache, vomiting, etc., puncture will show if there is a simple hypertension or a localized compression.

In simple hypertension, puncture is curative. Simple cerebral concussion is typical of this condi-

tion. A single puncture will often suffice, but several may be necessitated.

In basal fracture also, puncture is curative. It is the best method of decompressing the base of the brain. In severe cases the authors make a daily withdrawal of 30 to 40 ccm. They have obtained success in dangerous cases.

When Jacksonian epilepsy is due to some irritating agent, such as a projectile, bone particle, etc., and this cause can be diagnosed, the only logical treatment is removal. But when the source of such complications is obscure, lumbar puncture is a valuable resource. In such cases if puncture fails to bring about a successful result, it is almost certain that there is a cause which must be sought by a craniotomy. The authors operate only for post-traumatic epilepsy after having made a series of punctures without improvement.

For the reduction of a cerebral hernia in the early stages lumbar puncture is very efficacious. If a sufficiently large extraction of fluid is made, a complete reduction of the tumor is effected even at the first attempt. But daily punctures must be repeated, and it will be observed that at each treatment the tumor becomes smaller and smaller, and that it will disappear after eight or ten days. If it should reappear, puncture is again done.

The authors describe four cases of meningitic post-traumatic complications treated by lumbar puncture.

W. A. BRENNAN.

Barány: The Open and Closed Treatment of Gun-shot Brain Wounds (Die offene und geschlossene Behandlung der Schussverletzungen des Gehirns). *Nord. med. Ark.*, Stockholm, 1916, xlix, *Kirur. H.* 6, No. 20.

Barány was shut up in the fortress of Przemyśl for nine months during the siege and in this time he treated more than half of the cases of brain injury that needed surgical care.

Although like others he at first was inclined toward conservative treatment and delay for the development of symptoms before operating, this policy was soon abandoned in favor of early operation. In the earlier cases the greatest trouble was experienced from the development of brain abscesses after operation. This was found to be the result of imperfect drainage of the wound after an otherwise faultless operation. Many cases were lost from this cause. Jeger, Kuttner's assistant, then suggested that the American cigarette drain be tried. It was found that complete drainage was best obtained by using thin strips of gutta-percha paper carefully introduced into the depths of the abscess.

By this method healing of all abscesses was obtained. While it is possible to heal brain abscesses, no way has been found thus far to cope with cases of encephalitis, which generally end fatally. There were only about 2 or 3 recoveries out of 120 of such cases in Przemyśl.

Barány has been led to the view that the open

method of treatment is not the only one proper in every case, as he had previously maintained, but that there are many cases where the closed treatment will give results, and which would have resulted fatally with the open treatment.

Bárány summarises his conclusions as follows:

1. The soft parts of the projectile trajectory are to be excised.

2. The brain wound is to be trimmed free for about $\frac{1}{4}$ cm. beyond the dura edge.

3. All contaminating matter as hairs, bone-splinters, etc., are to be cleared from the wound. Bone splinters are to be removed carefully with the little finger.

4. In case of serious loss of dura substance, if circumstances permit, the brain orifice is to be covered with a strip taken from the fascia lata of the upper limb, the smooth side being turned towards the wound.

5. The wound is to be closed perfectly without drainage.

6. In segmental wound where the bone has been driven into the brain, the procedure is exactly similar to 1 regarding tangential injuries.

7. In segmental shots where the bone has only been splintered between the bullet openings without having entered the brain, the entrance and the exit orifices of the bullet only are to be excised, the bone splinters removed and complete suturing done.

8. For transverse through and through shots, the same procedure as in 7 is followed.

9. When a projectile is retained, it is to be removed whenever possible. For this the position of the patient is important. The patient is to be placed in such a position that the bullet trajectory is in an exactly vertical downward position with the side where the bullet entered. The bullet should then fall out by force of its gravity. Whether the bullet can be removed or not, the skin wound is to be closed and covered with fascia lata.

W. A. BRENNAN.

NECK

Walton, A. J.: *A Series of Fifty Cases of Exophthalmic Goiter Treated by Operation.* *Practitioner*, Lond., 1917, xcix, 309.

In an analysis of 50 cases of exophthalmic goiter treated by operation, Walton makes the following deductions:

A great many of the bad results are due to errors made in selecting the type of case for operation and the time when the operation should be performed. Each case must be kept in bed and watched for a sufficient time to permit the course of the disease to be recognized; operation should be undertaken only when the symptoms are in a period of relative abeyance, taking into consideration the length of time the disease has existed and the occurrence of visceral changes, the most common of which is dilatation of the heart.

The operative technique is as follows:

The patient is referred to the hospital without any knowledge that an operation is to be performed, put to bed, and kept there until the time is selected for the operation. During the period of waiting, the patient is given per rectum saline injections of one pint daily. On the day of operation, one-half hour before the time selected, she is given a mixture of equal parts of olive oil and ether in place of the saline. Seven ounces is the amount usually given to an adult woman. If necessary, the ether may be preceded by a hypodermic injection of morphine, one-fourth of a grain and atropine, one-hundredth of a grain, the aim being simply to allow the patient to be taken to the operating room in an unconscious state, when ether is given on an open mask. When the patient is fully anesthetized, a sand bag is inserted under the shoulders to throw the thyroid gland forward, and the field of operation is shut off by towels which are stretched to the patient's skin. The collar incision of Kocher is used. There must be no pressure applied to the gland and all bleeding must be controlled; this can only be performed by a process of gentle dissection, each vessel being isolated and securely ligatured before it is divided.

As soon as the patient is put back to bed the rectum is washed out to remove the remains of the olive oil and ether, and a pint of saline is injected. These injections are continued until the stage of reaction, lasting from one to four days, has subsided.

Walton divides the period after operation into five stages:

1. The stage of reaction lasting from two to four days.

2. The stage of primary improvement lasting for two or three weeks.

3. The primary relapse lasting for two or three months, from which gradual recovery is made.

4. The stage of instability when the patient is apparently cured.

5. The complete cure.

He says that much may be done to shorten the third and fourth stages and to hasten the onset of complete cure by seeing the patient at short intervals and carefully noting the condition. It is his custom to give every patient a slip with the following printed rules, which are based on those given by Ochsner:

Live a quiet life and avoid all forms of excitement, such as theaters, shopping, politics, etc.

Obtain as much rest as possible by going to bed early and taking a midday nap.

Have an abundance of fresh air, especially at night, and sleep with open windows.

Avoid all stimulants, such as tea, coffee, alcohol, or tobacco in any form.

Avoid meat and all meat broths and soups. At most, a little beef, mutton, or chicken should be taken once, twice, or three times a week.

Take as much milk as possible and foods prepared with milk, such as milk toast, cream, and buttermilk.

Eat cooked vegetables, fruit, either cooked or very ripe, eggs, bread, buttered toast, rice and cereals.

Drink plenty of good water. If its purity is at all doubtful, the water should be boiled before drinking.

The author has had a mortality of 4 per cent among his patients; 84 per cent are able to return to work and lead normal lives. G. W. HOCHREIN.

Shambaugh, G. E.: Ludwig's Angina. *Surg. Clin. Chicago*, 1917, I, 849.

A man 20 years of age complained of swelling in the floor of the mouth and the glands of the neck, especially on the right side, together with intense pain in this region and inability to close the mouth. There was great difficulty in swallowing. The affection began with a sore throat about one week before his admission to the hospital. The swelling in the mouth was raised to the level of the lower teeth and was board-like in resistance. It was

impossible to see the faucial tonsils. The mucous membrane on the floor of the mouth, as well as the sides of the tongue, was covered by dry whitish exudate. There was no discoloration of the skin nor any evidence of fluctuation. The temperature ranged from 101 to 103° F. The leucocyte count was 16,350. Cultures from the mouth showed an almost pure growth of streptococci. The treatment consisted of hot, moist dressings about the neck, alkaline mouth wash, and morphine to reduce pain. Six days after admission pus began to ooze from an opening somewhere under the tongue. The infiltration under the tongue increased in size and hardness, and on the tenth day was opened, followed by the discharge of about 2 drams of thick yellow pus. Recovery was rapid.

CARL R. STEINKE.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Chapin, H. D.: A Comparison Between the Clinical Examination and Roentgenograms in Diseases of the Chest. *Am. J. Obst.*, 1917, lxxvi, 704.

A comparison between the clinical examination and roentgenograms was made in 15 heart cases and 97 lung cases. In the former, the two examinations agreed in 7 of the 15 cases, partially agreed in 1 case, and 7 failed to show any correspondence in the conclusions reached by the two methods.

In regard to the lung cases, there was a substantial agreement in 77 cases, and a disagreement in 20 cases. Clinical examination indicated lobar and bronchopneumonia in 5 cases, when the X-ray failed to show such lesions, and the X-ray demonstrated lobar pneumonia in 5 cases, not found by clinical examination.

The author found Espine's sign of considerable diagnostic importance in diseased conditions at the root of the lung. He states that all so-called central pneumonias are in reality peripheral pneumonias.

W. L. BROWN.

Percy, J. F.: A Technique for Radical Cautery in Breast Cancer. *Ann. Surg.*, Phila., 1917, lxxvi, 397.

Modern surgery has recognized the necessity of preventing bacterial infection of the operative field. According to the author, the same principle should be observed in the operative surgery of carcinoma so that autotransplantation infection shall be prevented. The author suggests the cautery knife as a valuable substitute for the cold steel knife because it disseminates heat and heat kills the infecting organism of cancer. All tissues involved in cancer should be manipulated in the most gentle manner possible. The author has seen no untoward results from the use of heat, even when large areas of the

thorax, axilla and neck were denuded of their coverings. Necrosis of the ribs frequently follows the operation, but it has never been seen to go below the edges of the intercostal muscles; and pleurisy or pneumonia rarely develops. The majority of the patients are remarkably free from pain. Flaps can be made in the same way as with the ordinary knife.

The procedures in heat technique are as follows: Mark out on the iodine-covered skin with the cautery knife the limits of the incision to be made. Then lift up the skin with a tenaculum forceps, push the hot knife into and under the skin, and cut from within outward. Otherwise too great sloughing of the skin will result. In dissecting about the axillary vessels and brachial plexus, hold the tissues that are to be removed with the free hand encased in a medium weight rubber glove, keeping the fingers close to the cautery knife. This is the most practical way of gauging the degree of heat that the blood-vessels and tissues will stand without injury. Apply the heat until all the tissues that were fixed by the disease are freely movable. GATEWOOD.

Bevan, A. D.: Benign Tumors of the Breast, Chronic Inflammations, and Carcinoma. *Surg. Clin. Chicago*, 1917, I, 889.

Contrary to the older teaching that benign tumors in the breast are comparatively rare and that nine-tenths of the breast tumors are malignant, the author has found at least as many benign tumors as malignant. He suggests the following simple classification of tumors of the breast:

The common benign tumors come under the head of fibro-adenomata and cyst adenomata. These include the Schimmelbusch tumors, the benign papillomata and the benign cysts. The rarer benign tumors are the angiomata, lipomata, chondromata, osteomata, atheromata, and dermoids.

The malignant tumors are carcinomata and sarcomata. Sarcoma of the breast, in the author's experience, is a comparatively rare neoplasm. Fibro- and cyst adenomata and carcinomata form more than 95 per cent of the breast tumors coming to his service.

The differential diagnosis is discussed, and also tuberculosis, syphilis and chronic abscess in the breast. Three cases are reported, one a simple cyst, one a fibro-adenoma and the third a Schimmelbusch tumor.

Where multiple abscesses and fistulae of the breast are handled by simple incision and the introduction of drainage tubes, they very often become chronic and are not cured. Practically all can be cured by a thorough operation under a general anesthetic, opening up all the abscess cavities and scraping out the fistulous tracts; drainage tubes should not be introduced, but moist dressings under a very firm compression bandage should be applied.

Flat sea-sponges are compressed to one-fourth of an inch in thickness and applied under the bandage. They are moistened with borie solution. This exerts an even, well-distributed pressure over the breast.

EDWARD L. CORNELL.

Piqué, R.: Two Cases of Immediate Thoracotomy for Thoraco-Abdominal Wounds (Deux cas de thoracotomie immédiate pour plaies thoraco-abdominales). *Bull. et mém. Soc. de chir. de Par.*, 1917, XLII, 1796.

The first case reported by Piqué was a man with an orifice wound the size of a franc situated about 4 cm. to the left of the right nipple. Radioscopy showed a foreign body in the neighborhood of the diaphragm. A Delorme flap was made without fracture of the ribs, and the abundant hemothorax was evacuated. Small perforations found in the inferior lobe of the lung were not sutured. The liver dome was perforated; the foreign body was extracted from the hepatic parenchyma. Recovery followed.

In the second case a lumbothoracic perforating wound of the right side traversed the diaphragm. The projectile was in the superior lobe of the lung. Operation was done as in the preceding case and the projectile extracted. The projectile had in this case traversed the diaphragm and all the inferior lobe of the lung. The perforation in the inferior lobe was not treated. The man died on the seventh day of pleuropulmonary septicæmia.

This case illustrates the importance of disinfecting the whole of the track of the projectile. Autopsy showed that the upper part of the track had charitized well after extraction and suture, but that the lower part, which was not treated, was the starting point of a fatal pleuropulmonary septicæmia.

W. A. BRIDGES.

Lilienthal, H.: Empyema of the Thorax. *Ann. Surg. & Phila.*, 1917, LVI, 290.

The author reports his observation of one hundred cases of empyema of the thorax treated by major

and minor thoracotomy over a period of three years, from March 20, 1914, to March 26, 1917. These cases were operated upon regardless of the prognosis and regardless of the source of the pus. There were 64 cases under twelve and 36 over twelve years of age, and about twice as many males as females. The mortality was 23 per cent, showing a 5 per cent improvement over the cases treated during the ten years previously reported. No thoracoplastic operation was done in any of these cases; those patients who recovered remained in the hospital about thirty-seven days, on an average. This represents a gain of one week over past records.

E. B. FRIEDICH.

Richter, H. M.: Empyema; Simple, Interrupted and Continuous Aspiration. *Arch. Pediat.*, 1917, XXIV, 696.

The writer attributes the high mortality of empyema in children to the following three factors:

1. The intoxication of suppuration.
2. The loss of proteid material from prolonged suppuration.
3. The collapse of the lungs.

Death may occur from these factors after any drainage operation, but the first can more readily be controlled by some form of drainage. The simplest form of treatment is the removal of the greater part of the pus by several interrupted aspirations; sudden and complete evacuation of a pleural effusion of any considerable size is essentially wrong. In draining the pleura it is necessary to obliterate the pleural cavity as quickly as possible by drawing the lung up to the chest wall, and this is best accomplished by one of the modifications of Perthe's method of continuous aspiration. By its means the lung can be kept fully inflated and complete obliteration of the pleural space will quickly ensue. In this way the flow of fluid from the broad surfaces of the large suppurating pleural cavity can be reduced.

E. B. FRIEDICH.

Whale, H. L.: A Note on Mediastinitis as a Cause of Heart Failure. *Lancet, Lond.*, 1917, CCXII, 495.

After a massive gunshot wound of the neck, resulting in a gangrenous cavity which involves most of one or both anterior triangles, the possible causes of death are secondary hemorrhage, septicæmia, or septic pneumonia. In a second class of cases there is a cellulitic spread of infection initiating retropharyngeal infection. Drainage here is easy, but lower down toward the thorax it is more difficult.

A third type of case presents an insignificant wound anywhere about the neck with no signs of local or general inflammation consistent with increasing difficulty in swallowing or breathing. Stereoscopic skiagraphy shows a foreign body very deeply placed. In less than 48 hours the pulse and respiration rate have increased alarmingly. Adequate surgical drainage and cardiac stimulants are unavailing and in a day or two without the appear-

ance of illness the patient dies. The cause of death cannot be assigned to shock, septicaemia, nor heart failure.

The author cites three such cases in which autopsy showed a deep abscess or purulent lymph involving both vagi.

In general, the temperature is very irregular. It may rise to 104° and again fall. It may remain high or normal for an hour or for two days. The most characteristic feature is the sudden alteration of pulse and respiration rate. This startling alteration, especially if accompanied by an altered size or mobility of one or both pupils, indicating involvement of the sympathetic, forms a symptom complex. The diagnosis is vagitis due to mediastinitis.

As regards treatment, cardiac stimulants are of no avail; surgical cleansing of the wound down to the spine is no safeguard. In the after-treatment of very deep wounds in the neighborhood of the thoracic inlet, posture seems important. The patient should lie, if not on his face, at least semi-prone on the affected side, with the head low. But with the acceleration of pulse and respiration orthopnea is persistent and it is not possible to keep the patient lying down. The anatomical difficulties of good surgical drainage at the thoracic inlet are great.

V. C. HEST.

TRACHEA AND LUNGS

Iglauer, S.: Foreign Bodies in the Bronchi. *Interst. M. J.*, 1917, xxiv, 924.

The author reports two unusual bronchoscopic cases with special instruments used in extraction, and a case of spontaneous expulsion of an upholstery tack from the right bronchus.

A boy, aged six years, swallowed a steel-jacketed bullet and was taken to the hospital three days later. The physical findings and roentgenogram indicated complete obstruction of the left bronchus. A Kahler bronchoscope was introduced but it was impossible to grasp the foreign body with the ordinary forceps and so a flexible forceps was employed and the bullet withdrawn. It was 25 mm. long and 7 mm. wide. The use of a flexible forceps has some advantages when the tactile sense is employed in extraction, since there is but slight danger of traumatizing the tissues with such an instrument.

The second bronchoscopic case was that of a boy aged 12 years who swallowed an umbrella ferrule. The physical findings and roentgenogram indicated that, although the foreign body was a large one, a by-pass for air could be diagnosed. A Kahler bronchoscope was passed and a thimble-like body, with its wide end uppermost, was located firmly impacted in the right bronchus. The first attempt at removal of the foreign body was unsuccessful because the various kinds of forceps which were repeatedly applied slipped off and traction seemed to tilt the foreign body and draw its sharp edge into the opposite bronchial wall. The operation was discontinued pending the manufacture of a special

extractor; this consisted of a long brass rod with a tapering screw thread at one end which was intended to be screwed into the hole in the end of the foreign body on the principle of a bolt and nut. On the following day a low tracheotomy was made under local anesthesia to obviate the possibility of the foreign body becoming dislodged and fixed crosswise at the tracheal bifurcation or stripped off below the vocal chords. A short 9 mm. Jackson bronchoscope was introduced and the foreign body located. The special extractor was then screwed into the hole in the foreign body which was easily withdrawn until the tracheal opening was reached, when it was stripped off. It was immediately seized with a forceps and extracted. It was 15 mm. long and 10 mm. in its widest diameter.

The third case was that of a little girl, aged six years, who swallowed an upholstery tack. She was taken at once to the hospital where a roentgenogram showed the tack lodged head downward in the right bronchus, opposite the fourth rib posteriorly. The child was given 1/200 of a grain of atropine and sent to the operating room; but the operation was postponed for a short time until a suitable forceps could be obtained. Soon afterward the child coughed up the tack. Factors favoring spontaneous expulsion were the short sojourn, i.e., three or four hours, of the foreign body; the rest in bed; and the administration of atropine which possibly relieved the spasm of the bronchus. The tack proved to have but a moderately sharp point.

E. B. FREILICH.

Jackson, C.: Caisson Bronchoscopy in a Lung Abscess Due to a Foreign Body. *Surg. Gynec. & Obst.*, 1917, xxv, 424.

The author reports a case of a pin in the lung, which had been swallowed five years before. Caisson bronchoscopy was used in its removal. The author concludes that while caisson bronchoscopy was unsuccessful in finding the foreign body in this case, the usefulness of the method in the exploration of the interior of the lung abscess and the safety of such exploration were demonstrated. It seems probable that a larger foreign body or one not in an eccentrically located pocket could be so found.

The new malleable-ended forceps are useful in conjunction with localizing roentgenograms made with ordinary straight forceps in position at endoscopically known stations.

Numerous other points, though not entirely new, are important, especially: (a) the absence of reaction following careful bronchoscopy under local anesthesia in adults; (b) the absorption of less pus owing to improved drainage following dilatation of the strictured orifice of the abscess cavity; (c) the corrosion of steel in the lung without disintegration sufficient to permit coughing out, probably because of the firm enclosure of fibrous tissue; (d) the localizing value of the anteroposterior and lateral roentgenograms with the bronchoscope and forceps at various stations of which the endoscopic landmarks are known.

H. H. FREILICH.

Takensha, S.: The Macroscopic and Microscopic Findings in the Lung after Unilateral Removal (Ueber makroskopische und mikroskopische Befunde an der Lunge nach einseitiger Exstirpation). *Mitt. d. d. med. Fakult. d. k. Univ. zu Tokyo*, 1917, cvii, 159.

The author reports 21 experiments performed on rabbits, cats, and dogs. From his findings he draws the following conclusions:

1. Removal of the lung on one side leads to enlargement of the other lung. The enlargement is not noticeable at once but becomes distinctly visible after a few months.

2. It is observed that the alveoli of the remaining lung dilate in the beginning and assume a larger volume irregularly; finally they again become of uniform size.

3. An increase in weight is observed in the remaining lung and in the heart. This increase in the heart is not always found on the right side.

4. The enlargement of the lung is probably due to new formation of alveoli and small bronchial branches.

5. Freund's and Moellgard's theories regarding occurrence of emphysema were not verified. Bohr's theory has more validity, in the author's opinion.

6. The relative position of the other thoracic organs is only very moderately influenced by the removal of one of the lungs. The remaining lung, the heart, and the organs in the mediastinal space maintain their normal positions. Nor is there to be noticed a conspicuously high displacement of the diaphragm. The chest wall flattens, however, on the operated side.

7. As Hellin emphasized, the vascular supply to the remaining lung is considerably increased after unilateral lung removal. This congestion, however, gradually recedes with time. W. A. BRENNAN.

HEART AND VASCULAR SYSTEM

Derache: Three Cases of Cardiac Projectiles (Note sur trois cas de projectiles cardiaques). *Bull. et mém. Soc. de chir. de Par.*, 1917, xlii, 1750.

Derache reports three cases in which he extracted a cardiac projectile successfully.

In two of the cases the projectile was a rifle bullet, in one case encysted in the posterior wall of the left ventricle behind the apex, and in the other case resting on the left auricle. In the third case the projectile was a piece of shell lodged in the posterior wall of the left ventricle under the auriculoventricular ridge. W. A. BRENNAN.

Delorme, E.: Contribution to the Study of Cardiac Surgery (Contribution à l'étude de la chirurgie cardiaque). *Bull. Acad. de méd. Par.*, 1917, lxxviii, 243.

The case reported by Delbet to which Delorme refers was that of a soldier in which radiologic and stereoscopic examination showed a projectile situated in the right heart. The Delorme thoracic flap was practiced, the fifth rib fractured and the

pericardium detached with the finger. When the heart was reached, the right edge was incised for about 3 cm. and the foreign body in the cavity of the right ventricle was moved by pressure of the fingers toward the opening, whence it was extracted by a Kocher forceps. The index finger and the thumb kept the lips of the wound tight so that only a few drops of blood escaped. With Chaput's intestinal needle and No. 2 catgut a few non-perforating sutures were then rapidly placed. The wound was closed and dressed. The projectile was found to be an irregular cube of steel, one side of which measured about 1½ cm.

The operation lasted three-quarters of an hour. Recovery followed. General and stethoscopic examination made 38 days after operation showed symptoms of pleuralpericardial symphysis, tachycardia with instability of pulse, absence of arrhythmia, exaggeration of the oculo-cardiac reflex and diminution of the resistance.

Delbet concludes from his operation that the procedure is extremely simple and without any sensational incidents. With regard to this case Delorme reviews 17 cases of intervention reported in French literature for intracardiac projectiles. He gives short summaries of these cases; 3 were foreign bodies in the right lobe, 1 in the left lobe, 2 in the left ventricle, 8 in the right ventricle and 3 in the apex. A distinction is made between parietal and cavitory foreign bodies. The case reported by Delbet is of the latter kind.

Delorme records the following indications for and against operation:

1. When there is persistent pain, disturbed sleep, and extreme pain with violent palpitation on the least movement, operation is clearly indicated, whether or not the projectile penetrates and whether it is parietal or cavitory.

2. If the disturbances are slight and the projectile is parietal, the indications are rather against intervention. A small foreign body can become encysted and remain harmless indefinitely.

3. If the disturbances are slight, the projectile if situated in the left lobe should not be interfered with; if the projectile is regular it may be left wherever situated, but if irregular and jagged, intervention is called for.

Regarding the lasting effects of such operations, the known findings augur well and seem to favor intervention. Of a total of 13 operations made in France, there have been 3 deaths. Four operations made for foreign bodies in the right ventricle have all resulted successfully. W. A. BRENNAN.

PHARYNX AND OESOPHAGUS

Hayem, L.: Treatment of Penetrating Chest Wounds at the Front (Notes sur le traitement des plaies pénétrantes de poitrine à l'avant). *Presse méd.*, 1917, p. 627.

Since April, 1917, the author has treated 52 wounds of the lung and mediastinum reaching him

directly from the first aid posts. Within the first twenty-four hours after injury he operated upon: (a) penetrating wounds with a single entrance orifice and with a large projectile or one which menaces a large vessel; (b) wounds with a large thoracic breach. He has never had to operate on account of hæmorrhage. Cases which do not result in immediate death from hæmorrhage usually develop a hæmothorax which the author has respected for at least twenty-four hours on account of the spontaneous hæmostasis.

In all other cases abstention has been the rule, i.e., in seton wounds or single orifice wounds with a very small projectile. Twenty-three such cases cured spontaneously and were evacuated between the thirtieth and fortieth days. In 4 cases the projectile, though small, was troublesome and a secondary operation was necessary. Such interventions are very difficult on account of adhesions and pleural suppuration usually occurs. For such reasons the author has decided to operate in all cases except those involving extremely small projectiles.

The author's experience leads him to adopt resection of the fourth rib as the approach of choice. As an approach to the mediastinum, the lung, the pleural cul-de-sac, or for dissection of the hilus region, this resection gives a sufficiently large opening to view the conditions from the pleural dome to

the diaphragm and from the sternum to the vertebral column. Besides permitting rapid and easy intervention there is a minimum of operative injury.

The skin and muscle incision is made about 3 cm. beneath the fourth rib and parallel to the course of the rib. The muscular cutaneous layer up to the fourth rib is then lifted up. After resection of the rib the pleura is incised for the whole length of the wound. The intercostal muscles are also incised for about 2 cm. at their insertion in the superior edge of the costal cartilage corresponding to the resected rib. The cartilage is not resected.

The pneumothorax produced, which completes a preceding incomplete one, has never caused any cardiac or respiratory disturbances.

The author describes his treatment of the lesion according to the situation of the projectile to be extracted, whether in the pulmonary parenchyma, in the mediastinum, or in the pleura.

The results show that 43 per cent had an immediate operation; 44 per cent benefited definitely by abstention. There were 8 deaths, a mortality of 16 per cent; but most of these were in patients with the thorax largely opened by the trauma. The author thinks that while abstention is a beneficial procedure in penetrating chest wounds when its indications are limited, thoracic surgery gives excellent results.

W. A. BRENNAN.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Hull, A. J.: *The Cure of Inguinal Hernia.* *Brit. M. J.*, 1917, ii, 518.

Hull has charge of a special department of the British medical service for the cure of herniæ, dealing with cases at the rate of about 500 per year. The high percentage of soldiers who have inguinal hernia has made the problem of their treatment a serious one. Trusses are almost useless. The operation of choice is the one which will cure the hernia and render the man fit for service in the least possible time. The principle of the operation best adapted to this end, and found highly satisfactory, is the removal of the sac at the highest possible level with a minimum disturbance of tissues.

The technique is as follows: One-half per cent novocaine (with adrenalin) is infiltrated midway between the anterior superior spine and the pubic spine, and one-half inch above Poupart's ligament. The whole anaesthesia is conducted through this puncture without withdrawing the needle. Incisions are made one-half to one inch in length over the needle puncture down to the aponeurosis of the external oblique. Fibers of the external oblique are split one-half inch. Cremasteric and spermatic fascial coverings of cord are drawn through the aperture; the cremasteric fibers are separated and

the spermatic fascia incised. The sac lying inside these coverings is opened between mosquito forceps. Omentum, if present, is drawn out, ligated, and cut off. The inside of the sac presents two apertures, the internal ring and the inguinal canal. The two openings are separated by a fold of peritoneum, the crista, corresponding to the inner margin of the internal ring. Forceps are placed on the crista and the tube of peritoneum leading into the abdomen is separated by cutting through this fold. The neck of this tube or sac is now pulled out gently and ligated as high as possible, which is about two inches above the internal ring. When the sac is cut, distal to the ligature, the elasticity of the peritoneum will displace the ligatured sac well behind the rectus muscle.

In 90 per cent of the cases this is all that is necessary. The skin incision is sutured with silkworm passing down to and including edges of the external oblique. In cases in which a large internal ring or a very thin peritoneum renders recurrence more possible, the conjoined tendon is drawn over the cord and sutured to Poupart's ligament without enlarging the incision. By enlarging the incision in the external oblique a typical Bassini may be done.

Recurrence is usually immediately after the patient gets up, and is due to faulty ligature of the sac.

Troublesome sequelae such as hydrocele, retraction of the testicle, thickening of the cord, neuralgia, etc., due to injury of the spermatic cord, are avoided. The operation is performed above the matted scar of recurrent hernia almost as easily as if primary.

CARL A. HEDBLÖM.

GASTRO-INTESTINAL TRACT

Thalhimer, W., and Wilensky, A. O.: The Extent of Tissue to be Excised for a Radical Removal of Carcinoma of the Stomach. *Ann. Surg.*, Phila., 1917, lxxi, 421.

The authors' investigation was made for the purpose of determining the minimum amount of tissue adjacent to small carcinomata of the stomach wall which must be resected in order to secure a complete operative removal of the malignant process in those cases in which the regional lymph-nodes apparently are not involved and in which there are no demonstrable metastases.

From their evidence they conclude that in small carcinomata of the stomach, situated elsewhere than at the pylorus, the malignant process is so limited in extent that local resection at a distance from one to two centimeters beyond the macroscopic limits of the tumor will in the majority of instances remove the entire tumor.

The authors wish it understood that it must not be assumed from these observations that the accepted methods of surgical treatment of carcinoma of the stomach, such as pylorotomy or partial gastrectomy, are not necessary for a thorough removal of the diseased tissue. They emphasize the fact that such methods should be employed wherever possible.

The clinical significance of their investigation is two-fold:

Inasmuch as the surgeon frequently makes a local excision of an ulcer in the belief that the latter is benign in character, these investigations show that such a local excision is sufficient for a radical removal of the malignant process even if subsequent pathological examination shows the ulcer to have been carcinomatous in character. Of course such a local excision would be radical only when metastatic glandular involvement is not present.

When a malignant tumor is situated at the cardiac end of the stomach, the surgeon may either do a complete gastrectomy or consider these cases inoperable. The serious consideration of complete gastrectomy is almost forbidden in these cases because of the high mortality of this operation. Local excision of the tumor is a far less dangerous procedure, and, since the authors' investigations have shown that such local excision is sufficient for the removal of the malignant process, these tumors become accessible for radical operative treatment. Such excision again is only radical provided no metastases are present.

G. W. HOCHREIN.

Webb, R. C.: Operative Treatment of Hour-Glass Stomach. *Ann. Surg.*, Phila., 1917, lxxi, 418.

Webb reports a case of hour-glass stomach due to an ulcer, in which the pyloric pouch was three times as large as the cardiac pouch. The pylorus was obstructed by a large callus, apparently a cicatrized ulcer. A double posterior gastro-enterostomy was performed, without an enterostomy between the two loops. Two months after operation the patient was free from symptoms and had gained thirty-two pounds. X-ray pictures taken at this time showed that the stomach emptied rapidly and both gastro-enterostomy openings were working well.

G. W. HOCHREIN.

Wolkoff, A. A., and Klopfer, E. E.: Gastric Digestion of Various Foodstuffs After Gastro-Enterostomy. *Lancet*, Lond., 1917, xxviii, 308.

In experiments on dogs the authors found that with the pylorus open, food left the stomach both through the pylorus and the anastomotic opening. The most liquid part of the food came through the pylorus, while the more solid constituents came through the anastomosis.

H. J. VAN DEN BERG.

Palmer, D. W.: Hyperplastic Pyloric Stenosis. *Ann. Surg.*, Phila., 1917, lxxi, 428.

Palmer offers four reasons for presenting this subject: First, he believes this condition has been and is frequently overlooked; second, he wishes to bring out some of the essential features in the diagnosis; third, he wishes to comment on some of the surgical features and complications; and fourth, he desires to emphasize the fact that excellent results are obtained by surgical intervention with comparatively slight risk.

He believes that all cases of congenital pyloric obstruction have a constant pathology that rests on a far more tangible basis than any "spasm theory." He points out the similarity of the obstruction symptoms produced by prostate obstruction and congenital pyloric hyperplasia to prove the inability of spasm alone to produce the syndrome associated with the latter condition. He believes that the edema from increased muscular effort, or a fold of mucous membrane, or a curd of milk may be the factor to close a pylorus already narrowed by too great an amount of sphincter muscle.

A large majority of the cases are first-born males, breast fed, and perfectly well at birth, with healthy parents. The appearance of symptoms depends on the amount of hyperplasia of the pylorus. In a percentage of all cases, even where the obstruction is most acute, it is impossible to palpate the pyloric tumor because of the overhanging liver or the posterior position of the pylorus. If the tumor is palpable, it verifies the diagnosis, but if not, it by no means makes negative the diagnosis. The tumor often becomes palpable after the patient is anesthetized. Some cases require immediate surgical operation and others yield to medical treatment. All cases should be carefully watched.

The vomiting of a simple gastric or gastro-intestinal disturbance, intestinal colic and other forms of obstruction and injuries from various foods must be differentiated. One of the author's cases operated for pyloric stenosis proved to be a case of infantile mercurism or rumination.

He brings out the fact that pyloric stenosis has associated with it an unduly high percentage of cases of thymus enlargement. Another less serious complication is a postoperative discharge from the skin wound.

The average age of his eight living operated cases was seven and two-fifths months at the time last heard from, and the average weight was seventeen and two-fifths pounds, or one pound above the normal Holt average.

G. W. HOCHREIN.

Downes, W. A.: A Case of Giant Duodenum. *Ann. Surg., Phila.*, 1917, lvi, 436.

Downes reports a case of giant duodenum in a child of four and one-half years. The child weighed 6 pounds at birth and 20 pounds on admission to the hospital. He had had frequent fits of vomiting since birth, with periods of one to two months' freedom.

At operation the stomach appeared normal with possibly a slight thickening of the wall; the pylorus was normal, and the duodenum was dilated to the size of the stomach. The wall was smooth and three or four times thicker than normal. No diverticula, adhesions, or peritoneal bands were present. Distention involved the entire length of the duodenum, ending abruptly at the point where the gut passed under the superior mesenteric artery. No effort was made to determine the nature or cause of stenosis. The usual posterior gastro-enterostomy was performed.

One month after operation the patient was readmitted to the hospital almost in collapse, with distended abdomen and subnormal temperature. The abdomen was re-opened. It was found that the ligature had cut partially through and that there was a free communication between the stomach and duodenum. A new ligature was applied. The child improved for the first forty-eight hours following operation and then began to complain of pain in the epigastric region; at the same time a slowly forming mass could be felt in the right upper quadrant. On the fifth day after repeated enemas and the use of pituitrin the bowels began to move freely and the child continued to improve. There was no return of the symptoms.

The author believes that duodenojejunostomy best meets the indications in the giant type of duodenal dilatation and should have been adopted in his own case.

G. W. HOCHREIN.

McKenna, H.: A Case of Perforated Duodenal Ulcer. *Surg. Clin. Chicago*, 1917, i, 1963.

Etiologically, duodenal ulcers have a definite relation to focal infections, such as are found in the

mouth, ears, sinuses, etc. They are hematogenous in nature, as in appendicitis. The author reports a very interesting case of acute appendicitis following an attack of streptococcal tonsillitis, in which the same organism was recovered from the tonsils and the appendix.

In diagnosis, much dependence is placed on the history and the X-ray findings. History is typical as to periodicity, the attacks usually occurring in autumn and spring. Hunger, pain, particularly at night, vomiting and rapid gastric peristalsis are generally present.

All cases of ulcer of the pylorus and duodenum with constriction should be handled surgically and a gastro-enterostomy made. In all cases where the ulcer is not removed the scar should be covered by means of a purse-string suture, or a flap of omentum. Surgical treatment is imperative in cases of ruptured ulcer.

In the case of perforated ulcer reported by the author, there was a sudden onset of pain of such severity that the patient fell practically unconscious. Two hours afterward on arrival at the hospital he was semi-comatose, very anæmic and suffering extreme pain in the upper abdomen. The right side of the abdomen was rigid; there was no blood in the vomitus. White blood count was 14,000. A right rectus incision was made. The perforation was found in the duodenum; it was closed with Lembert sutures in such a way as to increase the lumen of the duodenum. A pedicled flap of omentum then covered the line of sutures.

The patient made an uneventful recovery.

C. A. BOWERS.

Jopson, J. H.: Intussusception in an Infant; Resection; Recovery. *Ann. Surg., Phila.*, 1917, lvi, 500.

Jopson reports the case of an infant seven months old who developed colic after a bowel movement, followed by persistent vomiting, not fecal.

The abdomen was soft and scaphoid, but not tender. A visible and palpable oblong tumor two by three and one-half inches was found in the lower portion in a median line below the umbilicus. Rectal examination disclosed no tumor, but blood and mucus were voided. There was no bowel movement after the attack. The temperature was 100.6°, the pulse 152, and respiration 38.

At operation intussusception of the small bowel was found. Rectification was attempted, but a constriction at the upper portion of the bowel made it impossible. The bowel was resected and a Murphy button used in an end-to-end anastomosis. On the sixth day the abdominal incision opened, and a few coils of intestine protruded. Under chloroform anesthesia the coils were replaced, drainage instituted, and after a vacillating convalescence the child recovered, and at this time is eighteen months old. The operation involved the removal of more than fifteen cm. of the intestine.

M. A. BERNSTEIN.

Decunatis, H., and De Gross, E.: Chronic Intestinal Occlusion by Adherent Hernia (Occlusion intestinal crurala per hernia adherente). *Semana med.*, Buenos Aires, 1917, LVII, 321.

The patient was a woman of forty-nine who showed a tumor diagnosed as a right crural strangulated hernia; on the left side there was another crural hernia which was apparently irreducible. The patient had symptoms of intestinal obstruction. She was operated upon and about 20 cm. of the large intestine resected, the ends joined by an end-to-end anastomosis. The patient made a successful recovery.

The case is interesting because of the symptomatology of chronic intestinal occlusion due to a left adherent irreducible crural hernia and also an acute occlusion by the strangulation of the patient's right crural hernia. Operation and histological examination showed that there was hypertrophy of the descending colon by a partial obstruction of the intestinal lumen, this hypertrophy being purely functional in origin.

W. A. BRENNAN.

Harrigan, A. H.: Torsion and Inflammation of the Appendices Epiploicae. *Ann. Surg., Phila.*, 1917, LXVI, 267.

These hitherto neglected anatomical structures may be the seat of pathological conditions which can simulate an acute abdominal lesion. In the case reported by the author the onset was sudden, the principal symptom being severe pain in the right lower quadrant. A diagnosis of acute appendicitis was made, but after the appendix was found not inflamed, search was made for other conditions sufficient to give rise to the symptoms. At the middle of the convexity of the sigmoid an appendix epiploica was found acutely inflamed and was removed.

The article concludes with a complete review of all of the published cases of disease of the appendices epiploicae.

D. N. EISENDRATH.

McKenna, H.: Early Recognition and Treatment of Acute Appendicitis. *Surg. Clin. Chicago*, 1917, I, 1969.

The author emphasizes the necessity for a campaign of education as regards the early recognition of acute appendicitis. He cites several cases where the diagnosis was overlooked and procedures undertaken which were distinctly harmful to the patient.

The symptoms of acute appendicitis and their order of occurrence are:

1. Pain, usually epigastric and cramp-like in nature, shifting to the right lower quadrant in twenty-four hours.
2. Nausea and vomiting; probably due to traction upon the appendix and meso-appendix.
3. Rise in temperature, usually occurring in the first twenty-four hours.
4. Leucocytosis. A differential count should be made to see if there is a relative polymorphonuclear leucocytosis.

Differential diagnosis will exclude:

1. Ruptured tubal pregnancy, marked by cessation of menstruation, sudden severe pain in the lower abdomen, abdominal distention, anemia, nausea and vomiting, rapid pulse, subnormal temperature, increased leucocyte count.
2. Acute gall-bladder, marked by acute pain in the upper right quadrant radiating around the right costal arch to the back and sometimes to the right shoulder, vomiting, sometimes jaundice.
3. Acute pancreatitis, marked by sudden onset of agonizing epigastric pain and persistent vomiting, severe collapse, weak and rapid pulse, belching and hiccoughs, distention of the upper abdomen, and acute anemia. Sugar may be found in the urine.
4. Stone or disease of the right ureter or kidney, marked by sharp pains in the bladder and penis and in the right leg. Blood or pus may be found in the urine. Ureteral catheterization, with X-ray, may verify the diagnosis. The Murphy hammer stroke will elicit pain in the region of the kidney.

There is practically never a fatality if the patient is operated upon within the first twenty-four hours. In suppurative cases the appendix is removed if it is in the field, but it is not disturbed if by doing so there is danger of disseminating the infection.

C. A. BOWERS.

Jackson, W. R.: Megacolon; Megaismoid. *Ann. Surg., Phila.*, 1917, LXVI, 441.

Jackson reports a case of megacolon in a male 22 years of age. For two years before operation he had had serious obstipation and great abdominal distention, especially in the upper abdomen, which strong purgatives failed to relieve.

Operation revealed all the colon to be moderately dilated and the sigmoid sacculated for its entire length. The sac was the shape of the stomach, measured 21 inches in length and 18 inches in circumference, and was about half-filled with fecal matter. The walls were thick and white in appearance. Excision of the whole sac or the dilated segment was done between two clamps and an end-to-end anastomosis by suture was made. The patient made an uninterrupted recovery. Two months after operation his condition was good and he had gained 15 pounds in weight. His appetite and digestion were normal.

The author states that the prognosis is grave in most cases with or without operation, but more recently the operative statistics have improved considerably.

G. W. HOCHBERG.

LIVER, PANCREAS, AND SPLEEN

Saussine, A., and Bertrand: Primary Cancer of the Liver in a Girl of Eleven Years (Un cas de cancer primitive du foie chez une fille de onze ans). *Arch. de méd. d. enf., Par.*, 1917, XX, 472.

There are only a few cases known of primary cancer of the liver in infancy, and it is rare under the

thirtieth year. The author relates the details of a case of primary epithelioma with a syndrome simulating an attack of appendicitis. The patient was a girl of eleven years who was finally sent to the hospital with a diagnosis of liver abscess. An operation of urgency was performed and the liver exposed and examined without any positive findings. The child died 8 days later. Autopsy showed the liver vastly enlarged and on its superior and posterior face a knobby whitish tumor. Histologic examination showed that the tumor was an epithelioma and its character showed that it was primary. There were no metastases.

W. A. BRENNAN.

Dennis, W. A.: Acute Empyema of the Gall-Bladder. *J. Lancet*, 1917, xxxvii, 595.

The author's records for the past two years show that 20 per cent of gall-bladder cases were operated upon for acute empyema.

When a stone becomes impacted in the cystic duct a condition of hydrops of the gall-bladder develops, the gall-bladder containing clear mucus and no bile. When a stone becomes impacted in the pelvis of the gall-bladder, hydrops does not develop, but in all cases of empyema this was found to be the location of the impacted stone. In explanation of this it is thought that because of the anatomical relations of the cystic duct and the cystic artery, a stone impacted in the pelvis of the gall-bladder produces pressure upon the cystic artery, interfering with the blood supply to the organ, lowering its resistance and rendering conditions more favorable for the development of an empyema. When the stone is impacted in the cystic duct there is no pressure on the cystic artery.

In acute empyema of the gall-bladder there is typical colic, the pain persisting for several days, ameliorated by morphine but not completely relieved. Fever appears, not infrequently accompanied by chills. Jaundice is usually not present. The gall-bladder is usually easily palpated in the absence of Riedel's lobe. Tenderness is a definite sign. An empyemic gall-bladder by adhesions and ulceration at times empties a part of its contents into the bowel.

Surgical treatment is indicated as soon as the diagnosis is made if the patient's condition warrants it. Where there is acute toxemia proctoclysis with bicarbonate of soda and glucose for a few hours allows operation to be undertaken with comparative safety. Delay should not be too great, as rupture of the gall-bladder may occur.

The operation of choice for empyema is cholecystectomy, for several reasons, i.e., lesser dangers of wound infection, certainty of not leaving an overlooked stone impacted in the pelvis, the avoidance of a second operation, more prompt and safe recovery. The chief contra-indication for cholecystectomy is a general condition so bad that an anesthetic is unwarranted, in which case simple drainage under local anesthesia can be done. With

a co-existing stone in the common duct, the stone may be removed and then cholecystectomy done.

V. C. HUNT.

Leede, C. S.: The Physiology of the Gall-Bladder Under Normal and Morbid Conditions. *North-west Med.*, 1917, xvi, 298.

The author attempts to solve the problem of when to drain and when to remove the gall-bladder. He has determined that the normal bile found in the gall-bladder is six to ten times richer in solids than bile found in the bile-ducts. In other words, 40 ccm. of normal gall-bladder bile is equivalent to from 240 to 400 ccm. of bile-duct bile. By reason of absorption of the inorganic salts by the gall-bladder, a change in the bile is produced which makes the gall-bladder bile less destructive when injected into the tissues than the liver bile. The mucosa of the gall-bladder also produces large amounts of mucus which possibly serve as a protection to the duodenum against the action of HCl.

He also believes that in all probability, although he has been unable to prove it definitely, there is a hormone secreted by the gall-bladder into the bile, which has a great influence upon the production of HCl in the stomach, and thereby of secretin in the duodenum. The bile-ducts and gall-bladder with the sphincter muscle of the choledochus are supplied by the splanchnic and vagus nerve. The existence of the sphincter muscle has been recently demonstrated by Rost. Irritation of the splanchnic nerve causes dilatation of the gall-bladder and bile-ducts and possibly contraction of the choledochus sphincter muscle, while irritation of the vagus nerve causes contraction of the gall-bladder and bile-ducts and relaxation of the sphincter muscle, the sphincter thus regulating the flow of bile.

The first morsels of food taken into the stomach cause the gall-bladder to eject some of its thick bile into the duodenum, where its hormone causes the secretion of HCl in the stomach. Food alone does not cause HCl to be secreted. As soon as the HCl enters the duodenum the mucosa of this organ causes the production of secretin, which is absorbed and acts upon the liver and pancreatic cells, causing a production of the respective juices. Meat and the products of protein digestion, therefore, because of the increased amount of HCl produced, which again produces more secretin, have the greatest influence upon the production of bile. Fats influence the bile production to a lesser degree, and water and carbohydrates hardly at all. Milk causes a strong flow of bile of long duration. Bile and bile-salts either taken by mouth or injected directly into the duodenum cause a strong flow of bile, and are therefore the greatest cholagogues.

Reach showed that morphine, adrenalin and pilocarpine caused a contraction of the sphincter choledochi, papaverine relaxing the sphincter and releasing the bile without increase in quantity. Carlsbad sprudel causes decrease in bile, salicylates increasing the flow. The so-called cholagogues.

mercury and phosphates, have no immediate effect upon bile production. The author reasons therefore that the real cholagogues are those foods and digestives which cause the increased production of secretin, and with it the increased production of bile and pancreatic juices. With reference to pancreatic secretion the author has found that normal production of acid of the stomach is the controlling factor in the action of the pancreas. Meat causes a strong flow of juices, but bread and carbohydrates are however the most powerful stimulant.

Ross found that animals without a gall-bladder secreted only one-third the amount of bile and pancreatic juice of normal animals, even though normal stomach contents were injected into the duodenum. He believes this is due to the lowered production of secretin, as it could not be due to the reduced HCl. The chyme of a normal dog containing a normal amount of HCl does not increase the production of bile to normal in a dog without a gall-bladder; it is obvious from this that with the loss of the gall-bladder something else is lost, probably the hormone.

Ohly of Cassel found that after loss of function of the gall-bladder 70 to 80 per cent of the cases showed anacidity and achylia gastrica. In a series of 36 cases of this type 71 per cent showed lack of free HCl, 17 per cent showed free HCl below twenty, and 12 per cent normal HCl. In another series of 43 cases in which stone-occlusion of the cystic duct or strong shrinkage of the gall-bladder was found, 84 per cent showed no free HCl, 14 per cent were subnormal and 2 per cent normal. In 16 cholecystitis cases without cystic occlusion, 13 showed anacidity and the other 3 subacidity. His dog experiments corroborated these findings. The author reasons that a condition which brings about the loss of function of the gall-bladder disturbs the secretion of HCl with more or less disastrous results to the patient.

Ross demonstrated on dogs that in those cases in which the bile-ducts had become continent the muscle fibers of the papilla vateri were well developed, and of those cases in which the bile-ducts were not continent this muscle was very poorly developed. It is very probable then that in those patients in which no stomach disarrangement appears the bile-ducts have become continent and are preventing thereby the constant dripping of bile into the duodenum with its associated chronic irritation. Where HCl is found in the stomach, even though there is an occlusion of the cystic duct, it is fair to assume that the gall-bladder is still functioning sufficiently to carry on the normal cycle, and in those cases where there is a hyperacidity present the gall-bladders are possibly in a state of hyperirritability, and therefore producing too much hormone.

The author concludes that in that class of cases in which lack of free HCl is found in the stomach and no occult blood in the stool, the gall-bladder is irreparably diseased and should be removed. In cases of cholecystitis and gall-stones with a

normal amount of HCl in the stomach contents, the indications are that the gall-bladder is still functioning and that drainage would be preferable.

The author urges conservation of the gall-bladder where possible in order to maintain the normal secretion of HCl, secretin and the other digestive juices.

LESTER H. HILL.

Willis, A. M.: The Advantage of Cholecystectomy in the Avoidance of Adhesions in Gall-Bladder Surgery. *Ann. Surg., Phila.*, 1917, lvi, 471.

The author reports a series of experiments performed upon dogs which tends to show that bile may stimulate adhesions if it comes in contact with tissues not surrounded by epithelium. In his first series cholecystectomy was performed without spilling the bile into the abdominal cavity. Only one dog showed adhesions and these were insignificant.

In the second series cholecystectomy was done, but the contents of the gall-bladder were emptied into the abdominal cavity. At the end of twenty-eight days one dog showed no adhesions, but the others showed moderate or numerous adhesions. Cholecystotomy with drainage was done in the next series and in each case numerous adhesions resulted.

In the fourth series after doing a cholecystectomy, the gall-bladder area was smeared with bile infected with bacillus typhosus. Many adhesions were the result. In the fifth series, bacillus coli was used in place of the typhoid bacillus. In series four and five the number of adhesions was greater than in the preceding experiments where normal bile was used.

It is the judgment of the author that the gall-bladder should not be explored by incision, but in uncertain cases it is better to do a cholecystectomy without drainage, as it is of the utmost importance that the irritating and frequently infected bile should not be allowed to come in contact with the peritoneum.

GATEWOOD.

Benham, F. R.: Indications for Cholecystectomy and Cholecystotomy. *Ann. Surg., Phila.*, 1917, lvi, 464.

Attention is directed to the fact that gall-stone colic may be a persistent symptom even where no gall-stones can be found. Benham believes that cholelithiasis should be operated upon as soon as the diagnosis is made. Many cases of so-called recurrence are due to overlooked stones. A diseased appendix if allowed to remain will continue to distribute infection to the gall-bladder contents after simple drainage of the gall-bladder.

The present technique followed by most surgeons is incision through a median high line to the ensiform cartilage so that the liver can be rolled out and the gall-bladder used as a tractor. Every case, according to the author, must be a law to itself in relation to the drainage or removal of the gall-bladder.

The author believes that cholecystectomy should be performed when the following conditions are

present: (1) when stones occupy the gall-bladder; (2) in the case of cholecystitis without stones; (3) when the wall of the gall-bladder is diseased; (4) when there are stones or any other obstructions in the cystic duct; (5) when there are adhesions around the gall-bladder which interfere with its pump-like action; (6) in the case of the strawberry or papillomatous gall-bladder; (7) in the case of malignancy.

Cholecystotomy should be used: (1) in cases of pancreatitis with jaundice; (2) in the very old and feeble cases or in those cases of poor physical conditions; (3) in those cases where the operation would be dangerous because of the inaccessibility of the gall-bladder. The appendix should be removed in every case in which there is the least suspicion that it is diseased. D. N. EISENDRATH.

Bullock, F. D., and Rohdenburg, G. L.: Splenectomy Exerts No Appreciable Influence Upon Immunity Against Transplanted Tumors. *J. Cancer Research*, 1917, ii, 465.

The authors report the results of further experiments in immunity to transplanted tumors. Their experiments were based on the assertions of Da Fano, Murphy, and others, that lymphocytes play an important part in the production and distribution of immunity and that the spleen as a lymphocyte-forming organ may take some part in the process.

The conclusions reached after observation on splenectomized animals are as follows:

Splenectomy has no effect upon the persistence of immunity induced by the receding rat sarcoma.

Splenectomy does not influence the fate of regressive tumors.

Splenectomized animals are no more resistant to immunizing agents than are normal animals.

Splenectomy neither increases the percentage of susceptibility nor favors the growth of spontaneous tumor grafts.

The removal of the spleen or testes has little or no effect upon the immunity induced in adult mice by embryo emulsion.

Record charts of the experiments are given, and references mentioned. L. R. GOLDSMITH.

Mayo, W. J.: The Relation of the Spleen to Certain Obscure Clinical Phenomena. *Med. Rev.*, 1917, xcii, 705.

The spleen may be enlarged to twice its size before the enlargement can be detected. Palpation gives the only definite information as to its size.

In 168 splenectomies in which there were various clinical manifestations, the pathological changes, both gross and microscopic, varied chiefly in degree.

In portal cirrhosis with enlargement of the spleen it is suggested that the source of the poisons may be the spleen. Removal of the spleen gives results which justify this belief.

The author has removed the spleen in 50 cases of pernicious anemia. There is no definite relation

between the size of the spleen and the seriousness of the disease, nor between the result of splenectomy and the size of the spleen removed. Temporary improvement occurred in every case. No patient has been cured, but in 75 per cent of cases the benefits obtained justified the operation.

In 19 cases of splenomyelogenous leukemia splenectomy has been performed after first reducing the size of the spleen with radium. All but two were markedly relieved. There were no operative deaths.

In hæmolytic icterus splenectomy has been performed 19 times with remarkable results. The jaundice which may have been present for years practically disappears in four days. There was one operative death.

The author has removed the spleen four times for biliary cirrhosis with satisfactory results in three cases.

Splenic anemia is cured by splenectomy in a high percentage of cases. In 43 splenectomies there have been four operative deaths.

In portal cirrhosis 5 splenectomies have been done with satisfactory results in four. One patient died following operation. H. J. VAN DEN BERG.

MISCELLANEOUS

Castellano, T.: The Importance of Left Axillary Adenopathy as a Diagnostic Sign of Abdominal Neoplasms (Importancia de la adenopatía axilar izquierda como signo diagnóstico de los neoplasmas abdominales). *Rev. méd. d. Rosario*, 1917, vii, 333.

Clinical observation for some years has demonstrated to Castellano the relative frequency of neoplastic metastases in the left axillary ganglia in cases of tumors of the stomach, intestine and peritoneum. He quotes from the literature to show how far this has been observed by various authors. The symptom appears due to the fact that the thoracic canal through which propagation is effected runs into the left subclavicular region.

The author mentions 6 cases in which left axillary adenopathy enabled him to make a diagnosis of abdominal cancer. In all cases a subsequent operation or autopsy confirmed the diagnosis.

The symptom of left axillary adenopathy has not received the attention which it merits. The author thinks it should be a matter of custom systematically to examine the axillary as well as the supraclavicular and inguinal ganglia in all cases where an abdominal neoplasm is suspected.

W. A. BRENNAN.

Johnston, W. H.: An Unusual Complication of Laparotomy for Gunshot Wound. *Lancet*, Lond., 1917, cviii, 533.

The case reported is that of a soldier, aged 26, who received a rifle wound in the abdomen. He was transferred to a casualty clearing station, where a laparotomy was done. Five perforations were closed in the small intestine and two tears in the mesentery. The patient had a mild peritonitis for

twenty-four hours, but convalescence was very satisfactory until the thirteenth day, when he was transferred to a base hospital.

At this time there was localized tenderness over the middle of the scar. The patient complained of slight pain; the abdomen was otherwise negative. Suddenly, on the same night, he was seized with acute abdominal pain, with frequent vomiting. Pulse was 120; temperature 100; there was general abdominal rigidity, considerable tympanites, great tenderness, but no dullness in the flanks. Early the next morning the patient exhibited all the signs of acute peritonitis.

The incision was opened and a large abscess cavity found on the posterior sheath of the rectus, which had opened through into the peritoneal cavity. The abdomen contained several pints of thin, greenish, purulent fluid. The organisms isolated were the staphylococcus pyogenes, the bacillus coli and a short-chained streptococcus.

The abdominal cavity was irrigated with Dakin's solution, and four drains of rubber tubing inserted. The wound was closed and the patient put in the Fowler position. Dakin's solution was used through tubes every three hours for the first two days, every four hours for the next four days and from then every six to eight hours, each time using 50 to 80 ccm.

The patient's temperature immediately became normal, and the pulse was normal on the third day. Owing to infection, all the stitches were removed by the third day. Some pockets of pus were found, but these were irrigated with Dakin's solution. Gradually the tubes were removed from the abdominal cavity, until all were removed by the eighteenth day. The patient made a good recovery and thirty-three days after the operation went to England.

The author suggests the further investigation of the use of Dakin's solution in the peritoneal cavity.

C. A. BOWEN.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Achille, F.: Infected Knee Wounds; Treatment and Results (*Ferite infette del ginocchio; trattamento ed esiti*). *Gazz. d. osp. e d. clin.*, Milano, 1917, xxviii, 723.

Achille's experience in the military hospital of Ravenna, and his study of the results obtained by others as reported during the war, leads him to think:

1. That small transosseal wounds of the knee generally heal without intervention.

2. That it is not always advisable to extract small projectiles buried in the articular head without serious bony lesions, as the operative act can awaken infective processes of extreme gravity. Careful immobilization and watchfulness ought to be the surgical aim in these cases.

3. In recent lacerated-articular wounds, early intervention, the use of non-caustic fluids and the promotion of proteolysis by hypochlorites is the procedure of choice.

4. When an infective process is evident, the existence of a fracture of the articular head will be assured by radiographic examination, as well as the presence of any foreign body. Simple arthrotomy is always insufficient to dominate an infection. In such cases, if the condition of the patient permits, an atypical resection should be attempted, using the low curved Mackenzie incision; this should be completed by the excision of all the synovial and by removal of the patella.

5. In cases of infective arthritis not complicated by osseous lesions, when a wide aggressive arthrotomy and immobilization do not suffice to arrest

the infective process and there is a threat of sepsis, there should be a recurrence to the occlusive plaster apparatus, according to the procedure suggested by Ruggi. This is kept in place from 15 to 20 days. In this way a limb otherwise doomed will often be preserved.

6. Amputation of the thigh ought to be reserved for extreme cases or those in which the complication of an ascending infective osteomyelitis renders any attempt at preservation vain.

The author's statistics cover 56 cases, 27 of which were strongly infected penetrating wounds, some complicated by fracture and retention of the projectile. Wide arthrotomy was practiced in all 27 cases, with removal of foreign bodies and arthrectomy or partial resection.

Of these 27 cases 14 healed without other intervention; 1 died from sepsis; 12 had secondary amputation of the thigh with 8 recoveries and 4 deaths.

There were 4 cases of pyoarthrosis with existence of fracture and osteitis of the articular head. All were treated by atypical resection, removal of the patella and synovial sac. Three were cured; one had secondary amputation of the thigh.

There were 2 cases of comminuted fracture of the articular head with acute sepsis due to grenade injury and in which amputation was not advisable; both died. The remainder of the 56 cases recovered.

W. A. BRENNAN.

Taylor, H. L., and Barrie, G.: Juxta-Articular Bone Lesions of the Hip. *J. Am. M. Ass.*, 1917, lxx, 1227.

Many affections of the hip formerly classified as tuberculosis are now recognized as distinct conditions, since the wider use of the X-ray. Conditions

such as coxa vara and slipped cartilage epiphysis are not difficult of diagnosis. More recently osteochondritis or Perthe's disease, a perfectly benign affection, has been studied and separated from tuberculosis of the hip. While studying Perthe's disease, cases are seen in which the symptoms are persistent lameness with little pain and stiffness, and which clinically cannot be differentiated from osteochondritis. But instead of a flat and irregular epiphysis, the X-ray shows a perfectly normal head and epiphysis with a spot of osteolysis in the neck or trochanteric region. This is due to a process known as hæmorrhagic osteomyelitis, which never results in pus formation. In another class of cases localized infectious foci with pus formation, so-called "bone abscesses," are found. This may be due to an invasion of pus-forming organisms, or to the re-awakening of an old osteomyelitis. Similar processes may occur about the acetabulum.

These two classes of cases are also seen at the knee, ankle, upper extremity, and are rarely multiple. The most common symptom is lameness; and when a child suffers from persistent lameness, a thorough clinical examination should be made with the use of the X-ray. The diagnosis is at once made by the appearance of a light spot on the plate. The spot at first is about the size of a nickel and as it progresses may leave only a cortex of egg-shell thinness. Occasionally these cases have been diagnosed as sarcoma. However, there is no sequestrum, no involucrum, no pus.

In the advancing cases evacuation of the focus with moderate curettage of the cavity, and in the larger cavities the introduction of autogenous bone chips give good results. Restitution of structure and function are practically perfect. Short periods of splinting and recumbency are effective in the milder cases without operation. The lesion and lameness may last for several years. In about 75 per cent of cases an initial history of trauma is obtained.

The treatment of bone abscess consists in opening the bone and curetting the abscess cavity, disinfecting it with tincture of iodine, draining and allowing the cavity to heal by granulation.

J. J. KURLANDER.

Achard, H. P.: Regional Anæsthesia of the Upper Limb (A propos de l'anesthésie régionale du membre supérieur). *Progrès méd., Par.*, 1917, p. 323.

The author refers to the methods of regional anaesthesia of the upper limb devised by Kulenkampf and modified by Santoni. He thinks these methods are blind, more or less dangerous, and do not always give a sure result.

Achard proposes a method which, although it has the disadvantage of occupying about thirty minutes in execution, yet is absolutely without danger and is sure. The technique is as follows:

1. The patient is put in the classic position for ligature of the subclavian artery.

2. Under local anæsthetic an incision from 1 to 2 cm. long is made along the upper edge of the cla-

vicle. This will be outside the artery. After making the incision if the venous confluence is directly met it is pushed inward and upward in the manner opposite to that done in the operation for ligature of the subclavian.

3. The aponeurosis is incised; and immediately at the bottom of the incision the white cords of the brachial plexus are seen, reduced in this spot to three nerves only.

4. Five ccm. of five per cent novocaine are then dropped in the bottom of the wound; a few moments later an injection of one ccm. of two to four per cent novocaine is injected with a fine needle under each of the three nerve sheaths. A bath of ten ccm. of one-half per cent novocaine is given to the whole region and a suture of the aponeurosis and teguments is made by a couple of stitches in one row. Anæsthesia is certain because every nerve has been seen. There is no fear of any arterial lesion because operation is done quite openly.

As a general rule anæsthesia of the upper limb by this method is complete at the end of ten minutes and it is prolonged to one and one-fourth hours.

The author adds that it is essential that a concentrated solution, two to four per cent, be used in injecting the nerves because the more voluminous a nerve cord, the more necessary it is to have a concentrated solution in order to reach by osmotic tension not only the superficial fibers, but also the central fibers, and it is on account of the high contents of the liquid in an anæsthetic substance that only a small quantity is employed. W. A. BRENNAN.

Knaggs, R. L.: A Case of Osteo-Aneurism; Diffuse Traumatic Aneurism in the Surgical Neck of the Humerus. *Brit. J. Surg.*, 1917, v, 243.

The author reports an interesting case of traumatic aneurism, occurring in the interior of the humerus, the patient having been wounded in the left shoulder on September 15, 1915. He was first treated in a general hospital in France for thirteen days; he was then sent to England on October 2, where he was admitted to another hospital.

The bullet had passed through the surgical neck of the humerus; the wounds were healthy and apparently superficial when he was admitted. On the night of October 21, he suffered a great deal of pain in the shoulder and the next morning pulsation was first detected about an inch above the exit wound. The upper part of the shaft was considerably enlarged and this was the subject of expansile pulsation. The main artery could be felt to be normal. There was no thrill, and no bruit could be made out.

A roentgenogram was taken October 16; this showed a large irregular aperture in the surgical neck with commencement to the internal surface. Another roentgenogram taken October 31 confirmed the increased expansions of the bone and further enlargement of the space in the interior.

A diagnosis of rapidly growing endosteal sarcoma was made. On November 1 the interscapulothoracic

amputation, by Littlewood's method, was performed. Rapid recovery followed.

The tumor revealed, on macroscopic examination, a dark red membrane, a portion of the sac of traumatic aneurism. Further examination disclosed a portion of the original aneurismal sac in the highest part of the cavity.

Microscopic examination revealed no evidence of sarcoma, the walls of the cyst appearing to be constituted of organizing ossifying granulating tissue.

H. C. ROBERTS.

Young, J. K.: Syphilia of the Joints. *Med & Surg.* 1917, 1, 836.

Articular syphilis may manifest itself either in hereditary or in acquired forms. In hereditary syphilis, four different varieties may be enumerated: (1) simple serous synovitis, marked by excessive effusion and with little destruction of cartilage; (2) chronic synovitis with chronic hyperplastic degeneration of the synovial membrane; (3) osteochondritis, accompanied by chronic synovitis and necrosis of the epiphyses; (4) chronic arthritis, secondary to osteomyelitis, periosteitis, or osteitis of the shaft.

In the acquired forms, syphilitic arthritis may manifest itself in the secondary or in the tertiary stage. The articular lesion which occurs coincidentally with the secondary symptoms is characterized by simple, serous synovitis, transient and evanescent in nature, and leaving but little trace of destruction. Tertiary syphilis of articulations is characterized by chronic hyperplastic synovitis, with or without formation of gummata, and followed by destructive changes in the cartilage in and about the joints. Finally, there are the lesions resulting from tabes dorsalis, the well-known Charcot's joint.

Because of the prominence of the associated lesions, the diagnosis of hereditary syphilis is not so difficult as that of the acquired form. The latter is most frequently confounded with tuberculous or suppurative arthritis. The association of syphilitic arthritis with other joint lesions complicates the diagnosis; this is especially true of tuberculosis and mixed infections, which may be engrafted upon the lesion, thus masking the true diagnosis. In adults the diagnosis will be simplified by the discovery of lesions in the diaphyses of the long bones due to ancient periosteitis, the thickened, striated appearance of the periosteum being almost pathognomonic of syphilis. The synovial fluid should be examined by diagnostic puncture.

The roentgen ray diagnosis of syphilitic arthritis is a study of consuming importance. The most characteristic lesion noted is thickening of the periosteum, due to successive layers of deposit at the diaphyseo-epiphyseal junction. Unlike the blurring of the negative seen in early tuberculosis, the outlines of the bones entering into the formation of the articulation are distinct. When characteristic osteitis is present, there is darkening of the shadow from sclerosis of the bone above the area of activity,

with thinning at the seat of active inflammation. A destructive area is quite distinct, which never has the mottled, spotted, or grossly irregular appearance met with in malignancy.

Tuberculous chronic articular arthritis is characterized by the absence of ductation; the capsule is not thickened; the joint outline is distinct; there is limited motion, pain on movement, spasm and pronounced atrophy. In syphilitic arthritis there is slight effusion, the joint outline is clear, enlarged and indurated; there is some pain on motion, but no spasm, and slight atrophy.

The treatment of the different forms of syphilitic arthritis varies according to the type of the disease. The effect of mercurial preparations upon hereditary joint lesions is most beneficial and prompt. In the most common form, osteochondritis, after removing the necrotic tissue freely from the joint by surgical means, Young has seen pain disappear and healing begin almost immediately after the administration of mercurial preparations. The joint should then be supported by a plaster-of-Paris case and contractions carefully guarded against in the chronic forms by suitable orthopedic apparatus. In the later stages, massage, baking, and counterirritation by means of iodine are beneficial. In Charcot's lesion of joints spinal puncture should be made for both diagnostic and therapeutic purposes.

P. G. SKILLERN, JR.

Dickson, F. D.: Diagnosis and Treatment of Certain Subacute and Chronic Joint Conditions. *J. Missouri St. M. Ass.* 1917, XIV, 421.

The author discusses: (1) static arthritis of the knee; (2) traumatic arthritis of the shoulder; (3) epiphysitis of the hip; (4) loose bodies in the knee-joint.

Static arthritis of the knee is usually caused by faulty weight-bearing due to knock-knee, pronated feet, or a combination of the two, and is treated by correcting the deformity.

Traumatic arthritis of the shoulder, including fractures in the neighborhood of the shoulder-joint, often follows injuries produced when the arm is in an abducted position resulting in a tear of the antero-inferior part of the capsule. These injuries are too frequently dressed in a position of adduction and internal rotation which allows contraction of that part of the capsule and results in limitation of motion and pressure on the brachial plexus producing a referred pain down the arm. Another causative factor is focal infection, which should be sought and eliminated.

Acute epiphysitis of the hip is by no means always due to tuberculosis. In this condition also infective foci play an important rôle.

Loose bodies in the knee-joint are often the result of osteochondritis dissecans. Differentiation should be made between this condition and dislocation of the semilunar cartilage; the roentgenogram shows a defect in the articular surface of the femur, generally on the outer side of the internal condyle. Trauma is the most probable cause.

R. B. CORIUS.

Roberts, P. W.: *The Etiology of Perthe's Disease*. *J. Am. M. Ass.*, 1917, 103, 10, 1595.

The author states that the etiology of osteochondritis of the hip, generally known as Perthe's disease, has been the subject of much speculation ever since the condition was recognized as a clinical entity several years ago. "Traumatism, obscure infection and perverted metabolism have each had their advocates. Tuberculosis has been eliminated because the joints recover with good function, and syphilis has been excluded because Wassermann reactions have been negative."

Notwithstanding the results of laboratory tests Roberts advances the opinion that this affection which occurs with considerable frequency in children is the result of inherited syphilis. In support of this view he states that:

1. A negative Wassermann is not reliable as infallible evidence of the absence of bone syphilis.

2. The pathologic findings described by Perthe coincide with one of the most common expressions of bone syphilis in children, namely, osteochondritis.

3. There are subjects with Perthe's disease who show dental evidence of inherited syphilis.

4. The course of osteochondritis of the hip is similar to that of many other syphilitic joint conditions in that the destructive process is self-limited and that there is a tendency to more or less complete restoration of function.

Roberts believes that the treatment of this condition on the hypothesis that it is of syphilitic origin is worthy of further investigation. In his experience all syphilitic bone and joint conditions improve more rapidly when the dose of potassium iodide is carried to the point of tolerance than when dependence is placed on a routine dose of moderate size.

PHILIP LEWIN.

Haller: *Fistulous Osteitis Consecutive to War Wounds* (Des ostéites fistulisées suite de blessure par projectiles de guerre). *Presse méd.*, 1917, p. 581.

Haller draws attention to the seriousness of the fistulous complications which follow bone injuries in war. Surgical treatment alone is capable of promising recovery to the patient.

In investigating the signs and conditions of an osteitis Haller gives particular emphasis to the value of radiography. Every patient with a wound which will not cicatrize ought to be examined radiographically at once. Aside from those cases in which the suppuration is due to a retained projectile, when there is an osteitic area radiography will show the modifications in the volume of bones as well as the structure of new bone, which shows quite differently from normal bone. In a fracture area radiography will show rarifying and condensed osteitis, osteitic cavities, subperiosteal callus, etc. The author thinks that radioscopy in such cases is useless. It is by radiography alone that the lesion must be read.

As regards treatment, it is difficult to lay down any general and precise rule to approach the osteitic

area. If there are cases where approach to the bone ought to be made through the fistulous tract, such as in a case of tibial osteitis fistulous at its antero-internal face, there are other cases which must be approached by a route other than the fistulous tract.

When the approach is through the fistula an elliptical incision is made around it and all cicatricial tissue excised. The soft parts are cut down to and including the periosteum by the bistoury. The periosteum is scraped away until the bone surface is exposed. When the fistulous tract is dangerous on account of the pressure of vascular pockets, another route must be selected, and this may necessitate reaching the osteitic cavity after breaking through much scar tissue. Whatever route is used, the osteitic area must be very widely exposed. The osteitic areas and cavities are then treated with the chisel and mallet, gouge and curette; the sequestra as shown in radiographs are sought and a thorough examination made of all corners and sinuities of the cavity. Examination of the bone cavities must be complete and painstaking, because even a very small area of osteitis left may give rise later to the same sequelæ. If a cavity is prolonged by a tunnel or pocket in the bone, such must be opened up and all affected tissue removed. After thorough cleaning of the infected bone the author has employed according to the case either Mosetig's paste, or tamponade, or an immediate muscular plastic operation in order to compensate for the bone loss.

The postoperative care depends upon which one of the treatments for crowning the cavity has been adopted. The author thinks that a plastic operation is the ideal method because it is done at the same time as the cleansing of the infected area. The soft subcutaneous parts easily slide toward the cavity to be filled and create adhesions. The postoperative treatment in such cases is slight. Withdrawal of the sutures about the eighth day follows. If hæmostasis has been careful, there are no accidents; but if not, a hæmatoma may result.

W. A. BRENNAN.

FRACTURES AND DISLOCATIONS

Ashhurst, A. P. C.: *Screw Fixation in Joint Fractures*. *Med. & Surg.*, 1917, 1, 812.

The author believes that accurate reduction of the fragments in a fracture near to or involving a joint as a rule may be secured by bloodless manipulation. It is more important to secure anatomical reposition in such fractures than in fractures of the shafts of long bones, but it is also easier.

In joint fractures failure of accurate reduction entails not only deformity but also marked limitation of motion; yet fortunately as one fragment is very short, its position usually may be controlled by the position in which the neighboring joint is dressed. For example, in supracondylar fractures of the humerus, hyperflexion of the elbow secures anatomical reposition of the lower fragment in contact with the diaphysis. There are those cases, however, in which bloodless manipulation will prove

unsuccessful even after several attempts under anesthesia. In such cases reduction should be secured by open operation and it is usually advisable to fix the fragments in proper position by buried pinwires.

The author discusses the various means of accomplishing this end by plates, nail fixation, ordinary wood screws, ivory or decalcified bone pegs, autogenous bone pegs, autotransplants. He believes the best method is that of Lambotte's screw fixation.

It is necessary merely to reduce the fracture, to clamp the fragments securely with the bone forceps, to insert the self-boring screw or screws, to remove the forceps and close the soft parts. Once the fragments are reduced, the first screw inserted holds them in position. There is no possibility that after a hole is drilled for the screw or the peg, the fragments may slip and fall out of alignment.

"The self-boring screws have flat heads, of such shape that they fit into a special holder which is adjustable to any ordinary brace. The screw point is then placed against the bone, the drill rotated until the screw is firmly fixed in the bone, the brace with attached holder is then removed from the screw, which is finally screwed all the way home by an ordinary screw-driver. In most cases it is well to employ two screws in order to prevent rotation of one fragment on the other; and the screws should not be placed parallel to each other; even at a slight angle one screw binds the other, and makes separation of the fragments almost impossible. It is not necessary to countersink the screw heads further than is done by screwing them down upon the cortex as tight as possible; usually the periosteum or joint ligaments rise to a level with the screw heads."

The screws should not be placed in a subcutaneous position exposed to trauma, as for instance directly over the epicondyle or epitrochlea at the elbow or over the subcutaneous surface of the external malleolus.

Ashhurst has used these screws in 26 patients and has never had to remove any of them on account of irritation.

PHILIP LEWIN.

Campiche, P. S.: The Late Correction of Malunited Fractures of the Extremities. *Calif. St. J. Med.*, 1917, **XY**, 420.

The author believes that many fractures carefully treated by the ordinary methods result in malunion and in impaired function, and necessitate some surgical intervention. The interval elapsing between the accident and the decision to submit to final operative correction is often much too great and may keep the patient for several months in an unnecessary condition of total disability.

The secondary correction of malunited fractures yields good results and should be resorted to as promptly as possible. In cases with a bad result, instead of a long interruption in treatment, the necessary correction should be recommended at an early date.

If these cases are recognized early, handled with

decision, and submitted promptly to operative intervention, much improvement will result.

In this field there are many available procedures and interventions, such as removal of interposed muscles and fascias, freeing of compressed nerves, osteotomies, bone-graft operations, occasional wiring, and resection or arthroplasty. Conditions may often be so improved as to give the patient a useful limb.

PHILIP LEWIN.

Walker, S.: Position and Traction in the Treatment of Fractures. *Internat. J. Surg.*, 1917, **XXX**, 319.

The author attempts to demonstrate: (1) that all fractures should be treated with extreme gentleness; (2) that the mere fracture of a bone is not the only injury done and not the only portion of the injured member to be treated; (3) that X-ray examinations are essential and should be done early and often; (4) that the position of the injured member based upon the new mechanics produced by the fracture and the prevention of deformity by the muscles is the best splint known; (5) that the classical position of the ends of the broken bone is not always seen at first. These are the positions that the new mechanics will produce.

E. C. ROBITSHEK.

Picot, G.: Thirty Cases of Complicated Fractures Primarily Sutured (Trente observations de fractures compliquées suturées primitivement). *Bull. et mém. Soc. de chir. de Par.*, 1917, **XLIII**, 1850.

Picot reports a series of thirty war fractures treated by surgical cleansing and primary closure. These include: 2 femur fractures; 12 leg fractures; 9 humerus fractures; 7 fore-arm fractures.

In his technique Picot makes very long incisions and large excision of muscles. The treatment is in no way sparing of the bone tissues. The bone surfaces are most minutely dealt with. The fractured surfaces and the medullary cavity are carefully and deeply curetted. If there are long fissures they are cleared and scraped on both faces. Every loose fragment of bone that is not removed is carefully rubbed with a compress soaked in ether. This is repeated several times.

The technique is long, difficult, and minute, but it is indispensable. Picot says that the toilet of the fracture must be made systematically, fragment by fragment, and every loose hanging piece of bone when left must be treated like the principal fragments. Closure of the wound is by superimposed planes, muscles, and skin. Bacteriologic control follows, the first test being made six hours after operation. When infection demands it, the wound is immediately re-opened.

The 30 cases gave 83 per cent perfect recoveries, 10 fistulae, and 2 failures.

Picot's technique has been adopted by several colleagues. Of 67 fractures, 35 were treated in this way and sutured primarily, giving 29 perfect recoveries, or 82 per cent.

Picot was able to execute primary suture in 88 per cent of the cases received by him and his rate of recovery is 80.3 per cent. His colleagues practiced primary suture in 50.0 per cent of cases of fracture received and obtained success in 82 per cent. The factors counting for success are early intervention and satisfactory transport with immobilization of the fracture.

W. A. BRENNAN.

Ridlon, J.: Congenital Dislocation of the Hip. *Surg. Clin. Chicago*, 1917, I, 271.

Ridlon states that most cases of congenital dislocation of the hip are in girls, and that in the majority of unilateral dislocations the left hip is affected. The time to replace the hip is determined primarily not by the age of the child but by the extent of shortening and the muscular development.

When the shortening is less than an inch the replaced hip almost invariably slips out again because the structural shortening of the muscles is not enough to hold it securely in the socket. On the other hand, one and three-quarters inches shortening in a child of good muscular development 8 or 9 years old is difficult to replace, although two inches may not be difficult in a child of three or four years of age.

The bloodless replacement usually called the "Lorenz operation" consists in a stretching of the capsule by extreme movements and manipulations in all directions and then a stretching of the limb by excessive traction. The adductor muscles are torn across subcutaneously by hacking with the edge of the hand. The abducted femur is then pried over the edge of a wedge block under the buttock until the femoral head passes into the socket. The author followed this method only to discard it.

Ridlon's method is as follows: The patient's flexed knee is grasped and the thigh fully flexed on the body. The operator finds the greater trochanter, neck and head of the femur with the fingers of his other hand and places the thumb of that hand in front below the anterosuperior spine of the ilium. The femoral head is then pushed downward to a position opposite the lower part of the rim of the socket. The thigh is abducted, while the opposite side of the pelvis is held firmly down by an assistant, and the head can be felt by the operator's fingers and thumb passing forward and into the socket.

When the limb has been placed in the most secure right-angled abduction position, the stockinette and sheet wadding are applied. With the patient's body resting on a sacral and back rest, plaster bandages are applied to make the permanent plaster cast. It is necessary to extend the plaster down on the leg with the knee bent at right angles to prevent the thigh from rotating.

When considering prognosis, the author divides hip cases into three classes: (1) those that are displaced backward and upward; of these 80 per cent give perfect results; (2) those displaced directly backward, among which 60 to 70 per cent give perfect results; (3) those displaced forward and up-

ward; about 50 per cent of this class give perfect results. The bilateral cases are classed by themselves and do not give perfect results in more than half the cases. Frequently but one cast is applied which remains for eight months. In older cases the first cast is removed at the end of four months, and after the legs are brought nearer together a new cast is put on; sometimes a third is applied.

When the cast has finally been removed, the mother or nurse makes a gentle inward rotation and stretching downward of the legs until after daily efforts the limbs are brought together and the toes point directly forward.

P. H. KREUSCHER.

Fowler, R. H.: Dorsal Dislocation of the Great Toe at the Interphalangeal Joint. *Med. Times*, 1917, xlv, 283.

The author states that there are few cases of interphalangeal joint dislocations of the foot on record. The majority have been noted in the great toe. As compared with dislocations at the metatarsophalangeal joint, which is a common injury, this particular dislocation is very rare.

Fowler reports a case. An 18 year old boy injured the great toe while playing football. Pain, deformity and disability resulted. Examination with the roentgenogram revealed incomplete dislocation with backward displacement of the distal phalanx. Efforts at reduction failed. Under gas anesthesia forcible correction failed, and an incision was made over the joint and the contracted tendon of the extensor proprius hallucis was divided. Reduction was easily and successfully obtained.

PHILIP LEWIN.

SURGERY OF THE BONES, JOINTS, ETC.

Chaput, H.: The Prevention of Ankylosis after Elbow Resection by Immediate Mobilization (Traitement préventif des ankyloses survenant après les résections du coude, par la mobilisation immédiate). *Bull. et mém. Soc. de chir. de Par.*, 1917, xlii, 1708.

Chaput gives short clinical histories of four cases in which he made an immediate mobilization after resection of the elbow for fracture.

The cases tend to demonstrate:

1. That immediate mobilization not only is not dangerous but that it is indispensable to avoid post-operative ankylosis.
2. That muscle and fat tissue interposition is useless.
3. That immediate mobilization is contraindicated when there is articular infection.

W. A. BRENNAN.

Alquier, P., and Tanton, J.: Traumatic Resection of the Hip for War Wounds (La résection traumatique de la hanche pour blessures de guerre). *J. de chir., Par.*, 1917, xiv, 113.

The authors have successfully practiced resection of the hip in 12 cases of war injuries. The results

have been followed up in most cases for a period varying from eight to twelve months. The procedure is new; nothing in the way of a conclusion can be drawn from the fact that in all 12 cases of hip resection there was a recovery. The operation is not benign, and a good deal depends on a constancy of other lesions with those of the hip.

Resections of the hip may be classified similarly to the division adopted for fractures of the femur, and distinguished as: (a) subcapitular resections; (b) transcervical resections; (c) basiscervical resections; (d) transtrochanteric resections; (e) subtrochanteric resections.

In the authors' cases there were 2 each of (b), (c) and (d), and 6 of (e). The portion of bone resected varied from about sixteen to twenty cm. One of the resections was primary and executed fifteen hours after injury; 10 were secondary; and 1 was late, three months after the injury.

The anatomic indications for resection are of three kinds, viz.: intra-articular lesions, juxta- and intra-articular lesions, and juxta-articular lesions. But another factor may arise, i.e., infection which modifies the entire evolution. The mode of treatment depends on the anatomic lesions, infection or otherwise, and on the preservation of function.

Recently Leriche declared that when a fracture was epiphyseodiaphyseal, and the upper femoral third reduced to splinters, immediate disarticulation was indicated as the only chance of safety. Delorme also expresses the opinion that resection should not in any case be made beneath the bitrochanteric line, as the results are deplorable. The authors do not share these opinions and they think that even in such cases as stated, when there is integrity of the large vessels and nerve-trunks, resection of the hip is capable of giving excellent results.

In intra-articular fractures with coxofemoral suppurative arthritis concomitant, the indication for early resection is even more pressing than in non-infected fractures. Arthrotomy in such cases is always insufficient. In extra-articular lesions likewise resection is indicated. It should be as extensive as necessary, but the important point is that the resection should be complete and total. It is only on condition that a disinfected surgical operation is immediate and complete that an aseptic evolution of a comminative fracture can be expected.

The authors discuss the value of resection as a means of preserving the function, which is the main objective of the surgeon after the preservation of the patient's life. To consider primary complete resection as the only means in all cases to save the life and the limb would be beyond the truth. The indications for primary resection are limited to the orthopedic indications. When primary disinfection of the fractured area fails, then there is an indication for secondary resection, which, if done in the best period, will assure the best functional results. In some of the authors' cases resection was not done until after the twentieth day. The authors think that an early intervention should be made to assure

drainage and disinfection of the area in all cases. If the lesions are such that the functional prognosis of a primary resection is not promising, then the intervention should be confined to a clearing operation, letting the case evolve until the optimal period when a secondary resection should be done if indicated.

The authors describe the operative technique of resection, both for intra-articular hip fractures and extra-articular fractures. In 8 of their cases of trans- and subtrochanteric resections they employed: in 1 case Ollier's incision; in 5 cases an external and posterior bent incision; in 2 cases a purely external incision approximating the incision of Ollier and of White. They emphasize that by a simple external vertical incision traced on the external face of the trochanter and of the diaphysis about two finger-widths above the summit of the great trochanter, it is easy to make a subperiosteal resection of all the superior extremity of the femur and to descend as far as necessary on the diaphysis.

The immediate postoperative treatment is immobilization and abduction. Immobilization is made by a plaster cast reaching from the base of the thorax to the toes. Its duration in cases of subtrochanteric resection varies from two and one-half to five months. With regard to position, the limb should be placed in about 35 degrees of abduction and in slight external rotation. This abduction must be maintained for a long time.

The later orthopedic treatment after removal of the plaster cast consists in application of a celluloid corset fashioned to the shape of the pelvis, hip and thigh, and supported by a Reclus stirrup, which is illustrated. The patient is permitted to get about with the aid of crutches. The celluloid corset ought to be worn from twelve to eighteen months or even longer to avoid secondary deviation of the limb.

The results obtained by the authors in their 12 resected cases included: 1 loose fibrous pseudarthrosis; 1 ankylosis; 6 solid pseudarthroses with restricted mobility; 4 operations still too recent to pronounce definite results. The 8 trans- or subtrochanteric resections gave: 4 solid pseudarthroses with restricted mobility; 1 loose pseudarthrosis; 3 results still too recent to report definitely.

The authors conclude that if they are subcapsulo-periosteal and are made secondarily in the optimal period, extensive epiphyseodiaphyseal resections of the hip can give very good results.

W. A. BRENNAN

Mosti, R.: Arthrotomy of the Knee in War Surgery, with Special Reference to a New Method. *Sull'artrotonomia del ginocchio in chirurgia di guerra con speciale riguardo ad un nuovo metodo personale*. *Poliedin.*, Roma, 1917, XXV, set. chir., 458.

Mosti thinks that the transpatellar method devised by Bougot and De la Rue is the most rational method of executing arthrotomy of the knee-joint in war surgery. In this the incision is vertical and

median on the anterior face of the knee, starting from the lower extremity of the patella across its anterior face and rising above it for about four or five finger-widths to the point where it meets the subquadricepsal cul-de-sac. But the method is too mutilating owing to the fact that the cutaneopatellar strip, left free until complete recovery, undergoes a very marked retraction and not only leaves a large deforming scar of the knee but also a very notable functional defect, i.e., the abolition of movements of extension. There is interrupted continuity of the patellar tendon.

For the purpose of avoiding these undesirable results Mosti applies a continuous extension to the cutaneopatellar strip, using a simple procedure: On the cutaneous face he fixes two wide strips of adhesive plaster. The two free ends brought together are fastened to an elastic tube. The tube is fixed to the end of a metallic stirrup fixed in the part of the immobilizing plaster cast which corresponds to the plantar part of the foot. The tube is kept in slight tension. The cutaneous strip thus acquires a strongly oblique position and the articular cavity is kept gaping so that the Carrel method can be applied. When a relative sterilization of the articular cavity has been reached, the tendon stumps are united with catgut by a tenorrhaphy and the cutaneous margins sutured without drainage. This is easily done as the strips have preserved their full length owing to the traction exerted on them. In general the secondary suture can be attempted from the tenth to the fifteenth day.

Mosti has adopted this method for some time past in the majority of knee wounds with the best results; he reports some typical cases. He claims that the transpatellar arthrotomy with the modifications made by him is applicable to every type of knee wound, no matter how much time has elapsed since the injury. It also fulfills other conditions which cannot be satisfied by other methods. He sums up the advantages as follows:

1. It widely exposes the greater part of the articulation, thus giving means for better drainage.
2. It enables a wide exploration of the articular cavity to be made, and by bringing eventual lesions into full display, facilitates the operative manipulation.
3. Elastic traction applied to the cutaneopatellar strip, while keeping it in a strongly inclined position, hinders its retraction, whatever may be the duration of the treatment.
4. Secondary suture both of the patellar tendon and of the cutaneous incision, made possible by the prevention of retraction, allows an almost complete restoration or a solid ankylosis in the best position. It obviates the large and deforming scars which generally result from other methods.
5. It is almost always possible in this method to conquer sepsis in the shortest possible time, and secondary resection very rarely becomes necessary, if it is not altogether eliminated.

W. A. BRENNAN.

Osgood, R. B., and Bull, E. C.: *Operative Treatment of Tuberculosis of the Knee-Joint in Adults.* *J. Am. M. Ass.*, 1917, lxxx, 1162.

In children the centres of growth are in direct anatomic relation to the joint, and disturbance of these centers by disease or operation may seriously affect the length of the limb. There is also a more marked resistance to the disease, and cures with only slight disturbance of function frequently occur when persistent and continuous fixation is combined with general treatment.

In adults the disease once established never fully recovers, in the authors' experience, without operative interference of some form. The diagnosis of knee-joint tuberculosis cannot be made with certainty in the acute stage. Several other monarticular affections may be mistaken for it: a subacute gonorrhoeal infection; syphilis; villous arthritis; simple chronic arthritis; or a traumatic arthritis.

The authors are convinced that the disease is at times primary in the synovia. They find the von Pirquet test to be of only negative aid in excluding tuberculosis. The subcutaneous test is of great value; a rise in temperature, increase of the local joint symptoms such as added heat, tenderness, etc., is almost conclusive evidence of the presence of the disease. The X-ray findings are negative when the disease is in the articular cartilage. Tuberculosis is a destructive process and when the bone is affected, loss of substance will often be shown. There are often lime salt deposits beneath the periosteum; typically there is a hazy appearance of the articular surface. The Wassermann and complement fixation tests are done as a routine.

The authors' practice is to operate as soon as the diagnosis is made. Operation is deferred for about a month, during which time the knee is put at complete rest with no weight-bearing. In this way the acuteness of the disease subsides. Only two types of operation are considered. When the disease is thought to be in the synovia, an exploratory arthrotomy through a three-inch lateral incision is done, and if no bony disease is found, the joint is injected with from one to four ounces of a 4 per cent iodoform-olive-oil solution. A second or third injection may be necessary. If the bone is diseased, excision of the joint is the procedure of choice.

Some method of fixation of the bone-ends aids in early union. Fixation is accomplished by the use of steel plates or kangaroo tendons. The plates must occasionally be removed. In those patients of sedentary occupations, 45 degrees of permanent flexion is given, while in those of a chiefly ambulatory occupation, from 15 to 20 degrees of flexion is allowed. A plaster cast is applied extending from the toes to the groin. Firm callus is usually present in from four to eight weeks, and weight-bearing with artificial support is commenced at three months.

The operation is not generally contra-indicated in the presence of visceral disease elsewhere, and after excision, such lesions in many instances improve greatly.

J. J. KURLANDER.

Galloway, H. P. H.: The Patellar Bone-Graft in Excision of the Knee. *Am. J. Orthop. Surg.*, 1917, 25, 344.

The author believes that excision of the knee is one of the most useful operations in surgery and that properly performed in suitable cases, it is practically free from risk and will uniformly yield results gratifying to the patient and creditable to the operator. His experience with the operation covers not less than 20 cases and in only one of these has he observed a degree of shock sufficient to cause the least anxiety. His technique is as follows: "The ordinary U-shaped incision from condyle to condyle, across the patellar tendon, is employed, this incision commencing and ending well backward slightly above the level of the condyle. The first incision is deep and clean and is rapidly deepened further so as to open the joint widely and permit the flap, including the patella, to be seized with the gloved hands and stripped upward so as to completely expose the upper cul-de-sac, the knee being forcibly flexed to facilitate this step of the operation."

The semilunar cartilages together with any easily accessible and grossly tubercular masses of soft tissue are then quickly cut away, but no attempt is made to carefully dissect out all suspicious tissue, since this is unnecessary. With a chisel, a thin flap of bone is then raised from the side of each condyle and turned upward, being kept out of the way, if necessary, by a temporary suture or two. Corresponding raw surfaces are created on each side of the head of the tibia, but in the case of this bone the bony flap is immediately cut away. The lower end of the femur and upper end of the tibia are then sawed off in such a plane that when brought together the bones will fit with accurately apposed plane surfaces when the leg is flexed about fifteen degrees in relation to the thigh, the direction of the saw cut being further planned so as to secure apposition without any greater lateral deviation of the leg than is present in the sound limb.

"Only a thin slice of bone should be taken at first, so that the plane of the cut can be altered by the removal of further thin slices should it be found necessary to do this in order to secure an ideal relation of the leg to the thigh. While an assistant steadies the upturned patella by seizing with a lion-jaw forceps the soft flaps in which it is embedded, the surgeon next removes the posterior half of the patella with the saw, and a corresponding flat surface is created with the same instrument on the front of the femur and tibia. After bringing the knee into the extended position and accurately fitting the bones together, a small incision is made through the skin on each side of the tibial head, about an inch and a half below the free margin of the bone, through which are driven two five-inch wire nails in such a direction as to cross each other and nail the bones securely together. The patella is then placed on the bed prepared for it and nailed across the front of the joint, its upper half in contact with the femur and its lower half in contact with the

tibia, thus forming a solid bony bridge across both bones. The flaps of bone raised from the femur are then brought into contact with the raw lateral surfaces on the head of the tibia. With a running suture of catgut, the deeper soft tissues are quickly brought together, the redundant flaps about the center of the flap being removed if found advisable. Interrupted sutures of silkworm gut complete the closure of the wound, except about one inch at the upper and posterior extremity on each side, which is left open for drainage. No vessels are tied throughout the operation and the Esmarch is not removed until a heavy dressing has been bandaged in place.

"It is most essential that the limb be carefully and firmly held, while the dressings are being applied, by an intelligent and experienced assistant who can move and handle the limb as necessary without exerting any strain on the joint, as the hold of the nails in the cancellous bone is rather precarious, and any carelessness may result in their being more or less loosened. Plaster is applied to the leg and thigh separately, these two parts of the lower extremity being then connected by three iron brackets which span the region of the joint and permit subsequent dressing if required. Further support of the joint, in addition to that supplied by the brackets, may be obtained by a firm cotton bandage applied from bar to bar of the lateral brackets as illustrated. Free oozing, sufficient to soak the posterior and lateral parts of the dressings, usually occurs, but is disregarded, and only exceptionally is the wound examined until three weeks have elapsed, at the end of which time the stitches and nails are removed; the large nails can usually be withdrawn with the fingers, but those fastening the patella in place ordinarily require removal with pliers. After sponging the line of the wound and the nail holes with a solution of biniodide of mercury in alcohol, clean dressings are applied and a fresh plaster dressing without brackets is put on from the top of the thigh to the toes."

At the end of four months, and often earlier, consolidation is usually complete and all protection is discarded.

PHILIP LEWIS.

Campbell, W. C.: Infraction of the Head of the Second and Third Metatarsal Bones; Report of Cases. *Am. J. Orthop. Surg.*, 1917, 25, 721.

The author states that the mechanical arrangement of the heads of the metatarsal bones renders them susceptible to severe injury from slight trauma, especially in the young who indulge in athletic games. Sudden jumping on the ball of the foot with the toes dorsiflexed and the heads of the metatarsals thrown downward causes this injury. Because the head of the second metatarsal bone is more prominent than any of the small toes, it is most frequently affected. In fact, this injury has not been observed in any of the other toes until recently. One case under the author's personal care suggests the possibility of the same lesion of the head of the third.

This lesion was reported first as a clinical entity in the August, 1914, issue of *SURGERY, GYNECOLOGY AND OBSTETRICS*, by Freiberg, of Cincinnati, who reported six cases, clearly defining the condition and its pathology.

The main symptom is severe pain in the metatarsophalangeal joint of the second toe, especially after walking. The head of the second metatarsal is distinctly thickened, very tender, and painful to all motion of the joint. The roentgenogram reveals a flattening of the head with laterally placed osteophytes. These may become detached as free bodies in the joint. Such a picture may be easily mistaken for some other non-traumatic process. Careful investigation usually reveals that the symptoms date back to stubbing the foot, as in basketball, tennis, running up steps, etc.

The condition may be relieved by felt pads, posteriorly placed, followed by steel bars in the shoe to limit motion of the joint. When such measures are not effective, removal of the free bodies often gives an excellent result.

Campbell reports 5 cases, 3 in detail. Of 11 cases reported, including Freiberg's 6, 9 were in girls about the age of puberty and 2 in middle-aged women. No case has been observed in males. The condition must be more frequently seen, but undoubtedly is the cause of quite a number of anterior arch disturbances probably hitherto not perfectly understood.

PHILIP LEWIN.

Lance: Equinism Consecutive to War Wounds
(Sur l'équinisme consécutif aux plaies de guerre).
Presse méd., 1917, p. 635.

The author comments on the great frequency of varying degrees of equinism following war fractures. There is equinism whenever the angle of flexion between the foot and the leg is reduced. This angle normally exceeds a right angle by from 20° to 25° . Hence it is an error to think that there is no equinism if the foot can flex at a right angle to the limb. Equinism will not occur, according to the author, if suitable prophylactic measures are rigorously insisted on.

Such measures may be outlined as follows: (1) every patient with a wound of the calf of the leg or of the Achilles tendon should have the foot maintained in good position in a splint. When the foot can easily flex, the splint may be dispensed with and a special method of bandaging applied which the author describes and illustrates; (2) every patient with contracture should be subjected as soon as possible to systematic mobilization, both active and passive, of the foot; (3) the splint employed should be one which bends the foot at 80° to the leg; (4) crutches and canes must be rigorously insisted with; (5) patients with cicatrized wounds should only be permitted to walk when with the knee flat the foot can be flexed at 80° without pain, and when the patient can crouch and flex the foot completely, the heel not leaving the ground.

The author's experience has convinced him of the

absolute uselessness of physiotherapy and mechanotherapy in the treatment of confirmed equinism. Vigorous orthopedic measures, extension apparatus, and plaster casts must be applied.

The author has observed more than 100 cases of equinism treated by tenotomy. The results were often very defective. In subcutaneous tenotomy the tendinous sheath if forced open cannot be reclosed. The skin invaginates between the two tendon stumps and adheres to their cicatrix. The result is very painful walking. Even if a high tenotomy according to Jalaguier's technique is done, the intratendinous cicatrix is not always solid and may rupture; this happened in some cases treated by the author. The inconveniences may be avoided by adopting the method of tenotomy by which there is a double transverse bisection, the two horizontal incisions being united by a longitudinal median incision.

The author has treated more than 200 cases of developing equinism. By the vigorous application of these prophylactic measures it has not been necessary to evacuate a single case for mechanotherapy nor to perform one tenotomy for equinism.

W. A. BRENNAN.

Groves, E. W. H.: The Methods and Results of Transplantation of Bone in the Repair of Defects Caused by Injury or Disease. *Brit. J. Surg.*, 1917, v, 185.

The transplantation of bone, depending as it does upon the fundamental facts of bone structure and growth, has been the subject of much experimental and clinical work.

Divergent views are held by leading workers. Havers, in 1692, gave the first accurate account of osseous structure, and he described periosteum as a connective-tissue, limiting and vascularizing membrane.

Ollier's work in 1867 was so thorough and so careful that his conclusions have attained an almost unassailable position. Unfortunately, that part of his work which related to the apparent osteogenetic function of the periosteum has taken so firm a hold upon surgical teaching that the remainder has been overlooked or forgotten.

Axhausen in 1898 was dominated by the idea, then universally held, that the periosteum was the principal agent in osteogenesis.

In 1911 Macewen denied that the periosteum was anything but a limiting membrane and he ascribed to the osteoblasts all the phenomena of bone growth and repair.

Axhausen has without doubt shown that after bone grafting the chief osteogenesis in the graft occurs beneath the periosteum. But it might equally as well be stated that the new bone is formed under the superficial surface of the old bone as that it arises from the deep surface of the periosteum.

It contains two well-marked stages, i.e., the early cartilage and the late bone; the former is converted into the latter. But the bone callus is next to the

bone, while the cartilage callus is next to the periosteum, showing that the site of origin of the whole was from the bone, and that it was formed from within outward, and not in the reverse direction.

The periosteum is chiefly a limiting membrane of the bone. The dense bone can live, grow, undergo repair, and produce fresh periosteum after the latter has been removed. In young bones it is possible to remove the periosteum in such a way as to produce an osteogenic membrane, this being probably due to the lifting of the episteum with the periosteum. In adult bones this is impossible, except after trauma or inflammation. Nevertheless, the retention of the periosteum, though not necessary, is highly desirable in grafting, because its presence affords a ready means whereby the graft may become vascularized.

The endosteum has precisely the same capacity for osteogenesis as the episteum, though in a lesser degree. Compact bone, if it has a proper blood supply, is quite independent of either periosteum or endosteum for both growth and repair. If deprived of its blood supply temporarily as in a graft, it acts in a very indolent manner, and the greater part of its cells die, but those on all the free surfaces episteal, endosteal, and cut edges survive and proliferate to form new bone. The tissue becomes vascularized, and in the new haversian canals new bone is deposited. Fragmentation of a graft may secure the survival of a greater number of osteoblasts, but it does not ultimately produce a larger bone.

Four American papers represent recent work suggested by Macewen's book and deal with experiments done on the same lines. Davis and Hunnicutt confirmed Macewen's experiments, and showed that periosteum, either as a flap or as a free graft, did not produce bone, but if a thin layer of bone was raised with this membrane, osteogenesis occurred. Brown and Brown also obtained results similar to Macewen. They added the important observation that living bone transplanted into soft tissue only survives for a short period, but ultimately undergoes absorption. Phenolizer's experiments demonstrated:

1. Actual osteogenesis occurs in the graft.
2. Osteogenesis occurs in a graft deprived of its periosteum and endosteum, but much more scanty than that occurring in whole or split grafts.
3. The most marked osteogenesis always occurs in the region of the episteum.
4. Of fragmented grafts many pieces die, but slow and scanty osteogenesis does occur around the separate pieces.
5. A fractured graft shows osteogenesis, i.e., callus formation at the seat of fracture, and this is even more marked than the osteogenesis occurring between the ends of the graft and the mother bone.
6. Free periosteum does not produce bone.
7. Bone transplanted into soft tissues atrophies.
8. In a periosteum sleeve from which bone has been removed, then boiled and replaced, a cylinder of callus makes its appearance on the deep surface of the periosteum.

McWilliams' experimental results demonstrated the practical importance of the periosteum. They showed that although nude grafts could live, yet they did so on a much smaller proportion than those transplanted with the periosteum. Split grafts also did better than whole ones. These observations confirm the importance of securing a ready blood supply to the episteum and endosteum.

Lever has had remarkable success in the transplanting of whole joints in human subjects, employing an especially careful technique. Joints taken from freshly amputated limbs or those taken from corpses within twenty-four hours of death may be used.

Living bone tissue can be cultivated *in vitro*, and the resulting phenomena have an important bearing on the problem of the survival of grafts and on the rôle of the different tissues. Dobrowskaja has carried out this work.

The author's experiments were performed on adult cats, using chiefly the tibia and the femur. He describes his technique and states that living grafts are better than dead; that autogenous grafts are better than homogenous; and that homogenous grafts are better than heterogenous. Sufficient weight of evidence exists to show that graft provided with periosteum and endosteum will more surely live and more quickly grow than a nude graft.

He gives the following summary of experimental results:

1. The most ideal graft is a piece of living bone used in its entire thickness.
2. Any kind of bone-graft gives better results when used whole than when broken up into small fragments.
3. Fragments of living bone, unless closely in contact with vascular tissue, act as indolent and passive structures and display no osteogenesis.
4. Dust formed from living bone does not maintain its vitality.
5. Cortical grafts are far better than intramedullary.
6. An intramedullary graft, if small and loose, takes no part in repair, neither does it act as a splint. If it fits the marrow cavities of the fragment tightly, it hinders osteogenesis and is frequently subject to fracture.
7. The success of the living graft depends very largely upon: (a) the extent of its contact with living bone; (b) the accuracy of its apposition; (c) the firmness of its fixation.
8. Firmness is of paramount importance in the repair of defects in long bones by grafting.
9. A graft of dead bone (boiled) properly fixed by metal sutures will give a better result than a living autogenous graft fixed by catgut alone.
10. Metal sutures and pins are useful in the fixation of many grafts. When properly applied they secure the necessary fixation, and there is no evidence that they hinder osteogenesis.
11. For use as pegs or nails there is no advantage in using living over dead bone.

12. Homogenous grafts, under favorable circumstances, act just as well as autogenous.

13. Dead bone grafts are certainly inferior to living, when used to fill defects in the long bones, but under favorable circumstances they become strongly incorporated into the living skeleton.

14. Provided that secure fixation of the graft to its bed is not disturbed, mobility of the limb favors osteogenesis, while immobilization hinders it.

With regard to clinical methods, exclusion of the skin surface from contact with the fingers and the instrument is very important. It is a matter of clinical and experimental evidence that the occurrence of a slight degree of sepsis does not prevent bone repair, though it generally hinders and delays it.

After a septic fracture, active inflammation may subside until only a sinus remains or this may heal up, and yet in the scar tissue real infective material of a very active sort may remain latent, and any wide opening up of the tissues will cause this latent sepsis to spring into a most malignant activity. In any case where a sinus or any open wound remains it is utterly unjustifiable to attempt a bone-grafting operation. The proper procedure is to extirpate the sinus, and then, when healing has occurred, to wait for several months, treating the limb by massage. If no relapse of sepsis occurs under this treatment, then the further operation may be undertaken.

It must be laid down as a primary rule for bone grafting that cutaneous scar tissue must be replaced by healthy skin before the operation, and deep scars must be excised during the operation.

Whatever view may be taken of the exact function of the periosteum and medulla, there can be no doubt that the preservation of both of these structures is a matter of importance in taking a living graft. Although new bone is probably the product of osteoblasts of the graft, nevertheless it is on the surface of the dense bone, i.e., from the epioseum and endosteum, that this new bone is laid down. The periosteum and marrow protect these surfaces, and act as vascularizing tissue to them.

It is necessary that a bone which has been grafted should be immobilized for several weeks or months after the operation. A light supporting splint is used for a few weeks, and when the wound is healed the limb is subjected every day to light massage with movements of the joints. In this way the nutrition of the muscles and the flexibility of tendons and joints are preserved, while the formation of new bone is encouraged. ISIDORE CHEN.

ORTHOPEDICS IN GENERAL

Lowman, C. L.: Results of Further Study in Leg Rotation. *Boston M. & S. J.*, 1917, cxxvii, 440.

A very high percentage of the posturally relaxed children have faulty foot positions which are mainly acquired but may be congenital. They usually have one or more groups of weakened or over-stretched ligaments or muscles caused by a too rapid growth or increase in body weight, plus a

faulty gravity line of the leg, or caused by weakness more pathological, such as malnutrition.

Treatment should not be confined to the feet. When the thigh drops into inward rotation from whatever cause, primary or secondary, the weight falls through wrong lines upon the lower leg and foot structures. The control or prevention of this faulty thrust should be the aim in any line of treatment. All children should be stripped for examination although they may have been referred only for weak ankles, flat-feet, knock-knees, or bow-legs.

An ordinary pelvic girdle is made, fitting snugly above the crest and sacrum. Two straps, one and one-half inches wide, of folded coutille or strong muslin, are sewed to this girdle. These pass from the midline posteriorly downward, outward, and forward, crossing the thigh anteriorly to the inside of the knee, over the condyle, behind the bend of the knee, and outward over the outer aspect of the calf, ending in a buckle at about the junction of the middle and lower thirds of the leg. Smaller straps of the same material, broader at their distal extremity and tapered at the top, according to the width of the buckle, are tacked in the shoes just back of the base of the fifth metatarsal. These pass inward under the front of the os calcis and scaphoid, through a slot in the stocking, upward and outward to the buckle on the leg strap. The patient stands on the outer border of the feet while these straps are buckled. On patients who wear a spine brace these straps may be fastened to the brace. In case of flat back the straps may be fastened to the girdle higher up and pass across the crest far enough forward to increase the pelvic tilt and correct the flattening. In spiral cases with genu recurvatum, or in cases that toe out markedly, the leg straps should be brought down behind the thigh, passing back of the knee to buckle on the inner side of the leg.

The shoe is usually corrected by having a one-eighth inch raise on the outer border of the sole under the heads of the fourth and fifth metatarsals but not extending to the toe, and a one-eighth inch raise on the inner border of the heel.

General and local corrective gymnastics and balance board exercises are given. Accompanying photographs show the leg harness and the apparatus.

CARL R. STEINKEL.

Turner, P.: The Treatment of Trench Foot and Allied Conditions by Bier's Method of Passive Hyperæmia. *Lancet*, Lond., 1917, cxciii, 638.

Raymond and Parisot treat cases of trench foot with gauze compresses soaked in a solution of camphor and borax in boiling water. The author believes that keeping the feet dry rather than wet yields better results. The etiology is summed up by saying that the condition is essentially one of inflammation due to the direct action of cold on the tissues. The histological examination shows that the chief changes are in the blood-vessels. Raymond

and Pariset hold that the cause of trench foot is due to an infection, and claim to have isolated an organism, a mould, *scopulariopsis konigii*, which is found in the mud of the trenches, and which penetrates the foot. They claim that cold and wet are of secondary importance.

Cases of trench foot are classified according to the severity of symptoms: (a) mild, where the skin is unbroken and there is swelling combined with sensory disturbances; (b) moderate, where blisters or small sloughs, or black and apparently gangrenous areas are present, and the sensory disturbances are more marked; (c) severe, where there are extensive sloughs, ulcers, or gangrenous areas of considerable extent involving perhaps several toes.

Treatment consists of cleansing the foot with soap and water. The feet are then painted with a one per cent solution of picric acid in methylated spirits, and this is repeated at first daily and later every other day. The feet are then wrapped in sterile gauze and exposed to the air until a covering of bed clothing offers more comfort.

As soon as the cleansing process is finished, a constricting bandage is applied just above the knees. It is left on the first day for eighteen hours, removed and re-applied after an interval of six hours. On the second and successive days the bandage is left on 22 hours out of every 24. The bandage is applied tightly enough to impede the venous flow only. There should be no pain; and if present, the bandage should be removed and after an interval again applied.

As a result of this treatment, pain usually disappears rapidly, and as a rule is absent after twenty-four or forty-eight hours. Anæsthesia improves, though not so rapidly as the pain. In cases of moderate severity, the small sloughs and blisters dry up and fall off, leaving a pink skin beneath. In the more extensive cases the gangrenous areas separate and the new skin is pink and very delicate, so that walking in hard shoes cannot be accomplished until the skin has become more toughened.

In slight cases the patient is allowed to walk in soft shoes after four or five days, and two days later is given hard shoes for short periods until the feet gradually become free from tenderness. In severe cases the process is slower. J. J. KURLANDER.

Straus, D. C.: *Hammer-Toe*. *Surg. Clin. Chicago*, 1913, 1, 1981.

The author reports two cases of hammer-toe treated by operation. In one the deformity was in the great toe, having been artificially produced to escape military service. Incision was made on the dorsal surface of the toe lateral to and parallel with the tendon of the extensor longus pollicis.

The head of the first phalanx was cut away by a curved incision and the base of the second phalanx fitted into the curved surface in extension. Joint capsule and severed tendon were then sutured and the toe put up in extension on a plantar splint. After twenty-five days the patient was walking with a straight movable toe. The second case was of the

more usual type in the second toe. In this a modified Jones operation was done. By an elliptical incision the callus was removed and the joint opened. The base of the second and head of the first phalanges were removed and the toe put up in extension with fresh bony surfaces opposed. This differs from the Jones operation in that the flexor tendon was not cut. Bony ankylosis was expected.

In hammer-toe of the second toe amputation should not be done because of danger of hallux valgus. In extreme cases nothing short of resection of the joint to produce ankylosis in extension is of any value. W. A. CLARK.

Sohmer, A. E.: *Fracture Sprains*. *Internat. J. Surg.*, 1917, xxx, 282.

So-called sprains are often associated with fracture of bone near a joint, usually a small fragment of bone being torn off by trauma. If overlooked, these leave the joint in a weak, painful or deformed condition, with limited or abnormal joint motion. It is more important to recognize a fracture in injuries which appear to be simple sprains than one which is frankly a fracture away from a joint, because of the bearing on subsequent treatment.

Fracture sprains disable by aiding the process of callus formation, offering subsequent interference with joint motion, the possible loss of proper attachment of ligaments and tendons, interference with fulcrum action of joints, and more or less dislocation with greater permanent deformity, to the factors of ordinary sprain without fracture.

The prompt recognition of fracture sprains is important in railway surgery because of its bearing on liability claims in cases of prolonged disability and permanent deformity.

To verify a diagnosis, the roentgenogram is the best appliance, either by stereoroentgenogram or plates in different planes. The fluoroscope is not reliable because of the small size of bone fragments and the relative density of tissues near joints.

A knowledge of the development of epiphyses at different ages is important in diagnosis, because of subsequent interference with growth of bones if the true condition is overlooked.

The prognosis of fracture sprains depends on its early recognition and subsequent treatment. They bear an important relationship to constitutional infection elsewhere in body, especially tuberculosis. Lessened lower resistance by injury may lead to local hematogenous infection. Treatment should provide for sufficient immobilization, careful massage and passive motion.

Fracture sprains which occur most frequently are the following: fracture of the ulnar styloid, accompanying Colles' fracture; avulsion of trochanters of the femur; condyles of the humerus; fracture of the tip of the olecranon or head of radius, the phalanges of foot or hand, the intrinsic cartilages of the knee, the malleoli of the ankle, and the os calcis.

In all injuries near a joint, every apparent sprain should be considered as complicated by a possible

fracture, until the latter has been excluded by every means of diagnosis, especially by X-ray plates.

Frantz, M. H.: Pseudohypertrophic Muscular Dystrophy. *Med. Times*, 1917, xlv, 279.

Frantz offers a general discussion of this condition, with a report of 2 cases seen within a month.

The author believes that progressive muscular atrophy is an uncommon disease and pseudohypertrophic muscular dystrophy, one of its forms, is still more uncommon.

In the differentiation of this condition he emphasizes: (1) the early onset; (2) the atrophy of the muscles above the pelvic girdle; (3) the pseudohypertrophy of the muscles below the pelvic girdle; (4) the pseudohypertrophy of the calf muscles.

The treatment of the condition is very unsatisfactory. He quotes Sachs and Brooke who advise electrical treatment; Collins and Climenko who found thyroid and thymus extract and strychnine of no value; McCruddin and Sargeant who gave adrenalin and pituitary extract and found in 1 case that the blood-sugar content as well as the cholesterol content increased. The author gave one patient pituitary extract and adrenalin by mouth and after two weeks' treatment the patient showed marked improvement.

PHILIP LEWIN.

Halstead, A. E.: Hereditary Deformans Chondral Dysplasia. *Surg. Clin. Chicago*, 1917, i, 951.

This condition is also known as multiple cartilaginous exostosis and multiple congenital osteochondroma. The characteristic findings in this disease are: (1) Multiple and more or less symmetrical osteochondilaginous growths are found upon the skeleton on or near the ends of the long bones, and occasionally on the bones of the face and skull; they have also been found on the pelvic bones and the vertebrae. These exostoses are generally benign, although cases in which they take on a malignant character have been known; (2) in a large percentage of cases the disease is congenital; (3) other malformations are frequently associated with these osteochondromata such as a low stature, due to the shortness of the lower limbs. As a rule the lower limbs are much shorter than the upper. There is also frequently observed a relative shortening of the ulna and fibula producing by the relative overgrowth of the radius and apparent luxation of the bone at one or both extremities. In the lower extremity, the lack of growth of the fibula causes a pes valgus. These deformities may be present before the exostoses make their appearance.

Pathologically, there is a chondrodysplasia affecting the metaphyses of the long bones principally. The epiphyses are rarely deformed. The intermediary cartilage is irregularly formed, and frequently prematurely ossified cartilaginous deposits are found along the shafts of the bone. These may remain unossified or present partly calcified areas. The cartilaginous areas or deposits later may develop into osteochondromata or chondromata.

The prognosis is uniformly bad. No cure is known. When the exostoses limit the movement in a joint by the size and location, they may be removed. The etiology is unknown. J. J. KURLANDER.

Peckham, F. E.: The Treatment of Scoliosis. *J. Am. M. Ass.*, 1917, lxi, 1233.

Peckham believes that true structural scoliosis develops from a diseased condition of the bones and ligaments of the spine. The etiological factor is that which interferes with calcium metabolism; this may be rachitis, infections, including auto-intoxications, or the rapid growth which often takes place during adolescence. The physiology of the endocrine organs is of great importance, and the thyroid gland in particular, which is supposed to preside over calcium fixation.

Treatment, therefore, consists in the administration of thyroid gland or mixed gland tablets and mechanical fixation in the over-corrected position where possible.

R. B. COFIELD.

Parker, C. A.: Acute Suppurative Destruction of the Upper Femoral Epiphysis; So-Called Epiphysitis. *Surg. Clin. Chicago*, 1917, i, 851.

Five cases of acute suppurative arthritis of the hip-joint with destruction of the head of the femur are reported. The pathology is usually a staphylococcus infection metastatic from some focus intercurrent with a general infection, and results in necrosis of the entire epiphysis, but sequestra are not always found.

It is limited in occurrence to the years of epiphyseal growth. The ages of the cases here reported are two, four, and eighteen years. Shortening of the femur always results and usually a flexion deformity.

Most of these cases come to the surgeon after the acute stage, when the treatment necessarily consists in the correction of the deformity. The hip-joint is usually greatly impaired but complete ankylosis is not common.

The correction of the flexion and adduction is accomplished under anæsthetic, subtrochanteric osteotomy sometimes being required; and the leg is held in the extension-abduction position by a plaster cast. Efforts to place the neck of the femur in the acetabulum or to reconstruct the joint are usually unsuccessful.

W. A. CLARK.

Mixsell, H. R.: Osteogenesis Imperfecta. *Arch. Pediat.*, 1917, xxxiv, 756.

The condition known as osteogenesis imperfecta is described as synonymous with fragilitas ossium and osteopsathyrosis. Attention is called to the influence of heredity in its occurrence. The multiple spontaneous fractures which occur are the result of a distinct deficiency in bone development, the haversian systems of stress-resisting bony rods being absent and the cortex extremely thin. The skull may feel like a rubber bag with mosaic inlays of small pieces of bone around the centers of ossification with the fontanelles wide open.

Metabolism studies of the patients show that the calcium retention is decidedly below normal. The general appearance is that of chronic illness; the skin is soft and delicate, the child is under weight, mentality poor, neck short, chest asymmetrical, extremities short and curved with any sort of deformity due to the fractures. The fractures are usually intraperiosteal and the callus formation is excessive. Structural markings in the spongy bone are absent and the medullary cavity is large showing irregular mottled shadows in the roentgenogram.

Two cases are reported; one, a child of eight months, had fracture of both femurs at birth, and three more painless spontaneous fractures in the first seven months. The skull was tabetic and the back kyphotic. The child improved on cod-liver oil and phosphorus. The other case, a year old, showed many lumps of callus on clavicle, forearms, thighs and legs, an evidence of multiple fractures. The child improved under the same treatment.

W. A. CLARK.

Lowett, R. W.: Orthopedic Problems in the After-Treatment of Infantile Paralysis. *Am. J. Orthop. Surg.*, 1917, xv, 98.

The author presents the five problems in the after-treatment of infantile paralysis which have given him the most trouble personally and about the settlement of which there is not always agreement among men of large experience. He believes:

1. That paralytic poliomyelitis is more often a weakening than a total paralysis of the affected muscles; that contractions are detrimental and troublesome and must be guarded against from the outset.

2. That the use of braces is conservative and preventive rather than therapeutic.

3. That fatigue is dangerous, easily induced and temporarily or permanently detrimental; that conservation and improvement of the affected muscles must constitute the aim of the orthopedic surgeon.

4. That of the therapeutic measures available for use in the after-treatment, muscle training meets the physiological and pathological requirements, but to be effective it must be based on a thorough and accurate muscular diagnosis and must be carried out with optimism, persistence and accuracy.

5. That such treatment has a definite effect upon the prognosis and is likely to furnish the

orthopedist with a degree of improvement and a proportion of complete recovery that is not, as a rule, considered possible.

PHILIP LEWIS.

Ryerson, E. W.: Tendon Transplantation for Relief of Paralysis Following Anterior Poliomyelitis. *Surg. Clin. Chicago*, 1917, 1, 721.

The case reported is that of a boy seventeen years old with flexion deformity of both legs and of the left thigh resulting from infantile paralysis followed by contractures of the muscles opposed to the paralyzed muscles. Operation in such cases is not advised until after two years at least, during which time repair is thought to take place.

In this case the paralyzed muscles were the quadriceps extensors of both thighs. The patient was unable to walk because he could not extend his knees, although the feet were in good condition. In order to restore the balance of muscle power about the knees, the semitendinosus and long head of the biceps were transplanted from their tibial insertions to the tendon of the quadriceps extensor at the patella.

First the flexion at the left hip was overcome by cutting the tensor fasciæ latæ at its origin under the crest of the ilium, the sartorius and rectus femoris muscles also at their origins. Incision was then made in the middle of the back of the thigh from the level of the head of the tibia upward almost to the tuberosity of the ischium. The long head of the biceps was dissected out, cut from its insertion and a kangaroo tendon woven into it. The tendon of the semitendinosus was treated in the same way. Plastic lengthening of the short head of the biceps had to be done to allow extension of the knee but the internal popliteal nerve still prevented immediate complete extension, so a Buck's extension was applied after the operation. The knee straightened in two weeks.

Incision was then made from the lower edge of the patella upward four inches and communication between this and the posterior incision made by dissecting back on each side of the condyles. Forceps were inserted from in front and the severed tendons picked up, pulled through and sutured into grooves cut in the periosteum of the patella. Since the biceps tendon was not long enough by an inch and a half, the bridge was supplied by the kangaroo tendon. The legs were kept extended in casts for six weeks.

W. A. CLARK.

SURGERY OF THE SPINAL COLUMN AND CORD

Bauman, G. I.: Treatment of Tuberculosis of the Spine. *Cleveland M. J.*, 1917, xvi, 637.

The author describes the method of treatment for spinal tuberculosis which he uses at the Rainbow Hospital, Cleveland. The children are placed on hyperextension frames; any pressure between the diseased bodies of the vertebrae is avoided as far as

possible. There is a marked decalcification in the area involved, leaving a soft, pliable mass which is held together only by the natural resistance of the soft parts, the thin bony framework posteriorly, and the contraction of the muscles. This mass can easily be disturbed by motion or compression. Efforts are made to hold the spine quiet, to avoid

the pressure of the weight of the body above the diseased area, and to promote healing.

It is gratifying to the author to note that the importance of recumbency in the treatment of the acute stage is receiving due credit. If it is combined with the proper amount of hyperextension and constant out-of-door living, the patient will be at the greatest advantage in combating the infection and the likelihood of subsequent deformity.

Various forms of hyperextension may be used, the gas-pipe frame, the plaster-of-Paris bed, mattresses or boards; decision should be left to the discretion of the surgeon. The author prefers the plaster or celluloid bed.

The period of recumbency varies with each patient and should be governed entirely by the progress of the case. In general, it should not be less than one year in the acute case.

"It is difficult sometimes to judge of the progress of the disease, but the following points are of value in determining the advisability of getting the patient up: the amount of recalcification and consolidation as shown by the X-ray; the progress of the deformity as shown by periodic tracings; loss of muscle spasm; complete absence of fever; no demonstrable abscess and no sinus. Probably most important of all is the behavior of the patient. These children lie perfectly happy and contented for months at a stretch during the acute stage and make practically no effort to get up. As the local condition improves the child manifests increasing activity, moving first its arms and legs more freely, then the head and spine. It finally becomes so active that further restraint is seen to be unwise if not impossible. A brace or celluloid jacket is then made and the child gradually gotten up. The lack of muscle atrophy is surprising in these cases. In fact the muscles often seem to develop as the child improves in bed."

Bauman believes that as a rule little reduction in the kyphos is obtained. Regarding heliotherapy he says that the first exposures should be short in order to avoid sunburn and should cover only a small part of the body. Beginning with the feet for ten to fifteen minutes, the area and the time are gradually increased. When one side of the body has been covered the other side may be taken. The total length of exposure varies from a few hours to practically the entire day. Improvement is much more noticeable after pigmentation is established.

The author states that fixation operations should be reserved for selected cases. He always makes a plaster bed before the operation so as to turn and handle the patient without shock or injury. Extreme care should be observed in handling the patient while under an anæsthetic, as the natural protection of the spastic muscles is lost. Recumbency and external fixation should be continued indefinitely after operation. The operation is confined chiefly to older children and adults; cervical and lumbar cases and very young children are excluded.

The author's conclusions are as follows:

Tuberculosis of the spine should be treated as a local manifestation of a general tuberculosis. Rest, heliotherapy, fresh air and good food are important, benefiting the local as well as the general condition. Abscesses should not be operated upon unless absolutely necessary. Fixation operations should be reserved for selected cases. PHILIP LEWIN.

Celesia, A.: Hydatid Cyst of the Vertebral Column (Quiste hidático de la columna vertebral). *Prensa méd. argen.*, 1917, IV, 114.

Celesia reports the case of a woman who showed pain in the lower limbs, incontinence of urine, vesical tenesmus and a flaccid paraplegia and contraction of the lower limbs. Later after a feeling of suffocation she expelled some hydatid vesicles by mouth. Radioscopy showed a clear oval zone at about the level of the sixth, seventh, and ninth dorsal vertebrae. On operation a focus of osteitis was found in the ninth dorsal vertebra and the corresponding rib on the right side; also a hydatidosis with small and multiple vesicles. The ninth rib was resected and disclosed a similar focus existing in the eleventh. A laminectomy was then made in order to examine the medulla, the dura mater opened and sutured immediately. The author tamponed the cavity containing the vertebral body; no toxic liquid was injected owing to the vicinity of the medulla. W. A. BRENNAN.

Main, D. C.: A Case of Injury to the Spinal Cord. *Med. Times*, 1917, XLV, 289.

The author reports the following case:

The patient was a negro, 28 years old, very robust, with no lues present. While loading logs, he fell from the top of the loading machine, striking the soles of both feet squarely upon a heavy timber. He complained of considerable pain in the lumbar region, in both legs and in his feet. He was removed to a hospital, put to bed and packed with sand bags. Urinary incontinence was continuous.

Three months after the accident examination revealed an injury to the spinal cord. At the junction of the last dorsal and the first lumbar vertebrae there was a bony ridge, very hard and non-compressible, evidently an impaction of the vertebrae.

Under general anæsthesia an incision four inches long was made in the region of the injury. On uncovering the injured vertebrae, no line of separation could be found. A laminectomy was done and three small blood clots removed. A year afterward the patient was working in the lumber camp, in good condition. Three years afterward he was still engaged in the same work. C. A. BOWERS.

Gonzalez, C.: Operation and Result in a Case of Spina Bífida (Un caso de espina bífida operato con éxito). *Rev. de med. y ciruj. práct.*, Madrid, 1917, XL, 167.

Gonzalez reports a case of spina bífida in a child forty-four days old operated upon by Suer of the Pediatric Clinic in the University of Valladolid.

The child was anesthetized with chloroform. A circular incision was made around the base of the tumor. A second incision sectioned the meninges and gave issue to the spinal fluid in great force, instantaneously emptying the sac and disclosing the cauda equina which was integrate in every respect. The lips of the large wounds were quickly clamped to prevent any further escape of the spinal fluid and to avoid fatal cerebral shock. At this moment the patient showed intense pallor with a weakening of the cardiac beats, but reacted to physiological serum. The suture of the membranes and the skin was rapidly done; the operation lasted 14 minutes. The child showed only a slight febrile reaction and the wound cicatrized in 35 days.

Two months later the child was in perfect health. The fontanelles show no dilatation, nor is there any symptom of intracranial pressure nor of reproduction of the tumor.

W. A. BRENNAN.

Gaenslen, F. J.: Simplified Technique in Laminectomy, with a Description of Combined Laminectomy and Spine Fixation by Bone Transplant. *J. Am. M. Ass.*, 1917, lxx, 1160.

The advantages claimed for the technique here described are: (1) rapidity of the operation; (2) diminished trauma; (3) diminished hemorrhage; (4) more accurate and firm closure and the possibility in suitable cases of combining with this method of laminectomy a spinal fixation by bone transplant.

The essential point lies in the fact that instead of stripping the soft parts and the periosteum from

the posterior vertebral spines on either side and then cutting off the spines at their bases, the spines are split longitudinally into right and left halves, just as in the Albee operation for Pott's disease. However, instead of deflecting the halves on one side only, they are deflected on both sides. It is then a simple matter to separate the periosteum with the attached soft parts from the lamina as far laterally as the articular processes. There is then left only a small amount of the process to be cut away with bone-cutting forceps, and the cord is exposed.

In certain instances, after laminectomy for urgent cord pressure symptoms, it may be desirable to fix the spine by means of a tibial transplant immediately after decompression of the cord. The method of approach, indicated above, by preserving the spinous processes and therefore retaining the usual number of bony contact points, paves the way for a successful bone graft.

R. B. CORFIELD.

Evans, W. A.: "Quiet" Pott's Disease. *Am. J. Roentgenol.*, 1917, iv, 530.

The case is reported of a child having marked destruction of the body of the fourth lumbar vertebra and involvement of the contiguous portions of the third and fifth, with prevertebral abscess, all of which was shown by roentgen examination. The only known symptoms were occasional slight pains in the left leg; there was no impairment of the general health. A small lump in the lumbar region led to the examination and discovery of the pathology.

ADOLPH HARTUNG.

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESES, ETC.

Bullock, F. D., and Rohdenburg, G. L.: The Relation of Induced Cancer Immunity to Tissue Growth and Tissue Degeneration. *J. Cancer Research*, 1917, ii, 455.

The authors assert that immunity can only be induced when the immunizing material consists of live cells derived from the animal species in which the tumor originated. Assuming this to be true, immunity may be due then either (a) to the growth or growth metabolites of the injected material as suggested by Haaland; or (b) to the death and degenerative metabolites of the injected material; or (c) to growth followed by death with their respective metabolites.

Dead cells are incapable of inducing the resistant state. Also tumor cells showing a rapid and prolonged power of growth do not invariably have the power of producing immunity. In one experiment the immunizing power of cartilage and bone was compared with that of fetal skin. The result showed

that immunity was present in 39 per cent of the animals injected with embryo skin, as compared with 19 per cent in the group injected with foetal cartilage and bone, and 8 per cent in the non-treated controls. It is suggested that a greater activity in the production of metabolites may exist in the embryo skin on account of the larger number of cells and active proliferation as compared with bulk with bone or cartilage. Large doses of embryo skin (0.05) injected for purposes of immunization degenerate rapidly, producing a large amount of necrotic material, while small bits of embryo skin grow and retain their viability for weeks.

The second experiment was for the purpose of finding out the induction of immunity through the absorption by the animal of some product of cell degeneration. For this purpose massive doses of the Flexner-Jobling rat carcinoma were used for the inoculations. The results of this experiment showed practically no increase in the immunity. An attempt was also made to cause immunity through the production of large amounts of necrotic tumor material by means of obliteration of the blood supply of the

tumor after the method of Rowen. The result of this experiment showed that very slight immunity, 14 per cent, resulted from the procedure, while the destruction of the blood supply did not prevent the further growth of the tumors.

In conclusion the authors state that induced immunity to transplanted cancer is not solely due to growth or the metabolites of growth of the immunizing agent, nor is it due to death and degenerative metabolites of the injected material.

L. C. GOLDSMITH.

Greenough, R. B.: The Handling of Early and Doubtful Cases of Cancer. *Ann. Surg., Phila.*, 1917, LXVI, 385.

The author sent out a circular letter to a large number of surgeons in this country in which he asked their opinion upon the removal of small pieces of tissue in suspected cases of malignancy in order to make a definite diagnosis. One hundred and thirty-four replies were received. As a result of the analysis of these replies, the author recommends the following procedure in the diagnosis of early and suspected cancer of different organs:

1. In suspected but doubtful lesions of the external skin, lip, tongue, palate, tonsil, buccal mucous membrane and rectum, excision of the entire growth, if small, should be performed. If large, excision of a portion of the growing edge of the lesion followed by cauterization is to be advised only after all other resources of clinical diagnosis, including consultation, have been employed, and then only when the facilities for immediate frozen section diagnosis are available and the operation for carcinoma, if it should prove necessary, can be completed under one anesthesia.

2. In suspected but doubtful lesions of the gall-bladder, kidney, prostate, testicle and ovary, removal of the organ should be practiced since the difference in severity of the possible operations for benign and for malignant disease is not sufficient to make an exploratory incision into suspected carcinomatous tissue a necessary or advisable procedure.

3. In suspected but doubtful lesions of the lymph-nodes in the neck, axilla, and groin, in cases where radical operation is a possibility, block dissection of the area involved, including the adjacent nodes, is to be recommended in preference to the excision of a single suspected nodule. In obviously hopeless cases, should cancer be present, removal of a single node may prevent a useless operation and is to be recommended.

4. In cases of sarcoma and obscure tumors deeply placed, exploratory removal of tissue cannot be recommended except when all facilities for radical operation are at hand; immediate frozen section diagnosis then should be secured.

5. To these recommendations may be added the routine pathological examination of all tumor tissues removed by operation. This should be made compulsory and to this end competent labora-

tories for the free diagnosis of pathological material should be maintained as a function of the State.

GATEWOOD.

Skiffern, P. G., Jr.: A Case of Melanocarcinoma Showing Its Stealthy Nature and Rapidly Malignant Course. *Med. & Surg.*, 1917, 1, 322.

Melanocarcinoma exceeds nearly all malignant neoplasms in rapidity and virulence of growth. Second to this are chorio-epithelioma and cancer of the tongue.

The patient in the case reported had since birth a black pigmented mole over the left mastoid. About three years ago after a slight injury the mole bled. Thereafter irritating objects which came in contact with the mole caused it to bleed. After these irritations the mole began to increase in size. Two years ago the mole was removed by an operative incision. There has been no recurrence in the scar.

Four months previous to admission the patient noticed for the first time two lumps on the left side of the neck behind the angle of the jaw. One month before admission these lumps became painful. On examination these tumors were smooth and regular in outline, slightly reddened, sensitive, apparently fluctuant, and firmly adherent. The diagnosis of recurrent melanocarcinoma was made. Despite radical removal of the tumors recurrence followed three weeks after operation, metastases to the lungs were revealed soon afterward, and the patient succumbed within three months of the operation.

Characteristic of a subcutaneous melanocarcinoma is the inflammatory appearance of the skin, which is of a dusky red hue. Care should be observed in incising such a tumor, under the mistaken impression that it is a phlegmon.

Pathologically melanocarcinoma arises as a migratory hyperplasia of the basal layer of the skin and invades the subcutaneous tissues and distant organs as pigmented and non-pigmented oval, spheric, or spindle cells. The author does not discuss the choice of terms, melanocarcinoma or melanosarcoma; but when the neoplasm arises in the skin, as in the case to hand, it is properly termed melanocarcinoma. For practical purposes it is necessary to perform wide excision of black pigmented moles which are exposed, before they have been subjected to trauma.

Guthrie, C. C.: Experimental Shock. *J. Am. M. Ass.*, 1917, LXIX, 1695.

The attempt has been made to devise a reliable and comparatively simple method of producing shock; to establish definite criteria for recognizing the condition and to observe and study at frequent intervals throughout the experiment as many phenomena simultaneously as was feasible; the author proceeded on the assumption that the grosser manifestations of shock were to be considered effects rather than causes. Accordingly, if the causative mechanism were to be observed, it would be most desirable to study minutely the phenomena

immediately preceding, during and following the application of the means used for producing shock, and to observe the effects of such therapeutic measures as might be indicated by the results.

Experiments were made on twenty-two dogs. The studies comprised blood-pressure, pulse-rate and character, vasomotor reflex response, vasomotor tone, respiration rate, amplitude and regularity, volume and composition of expired air, blood hydrogen-ion concentration, reserve alkalinity, hematocrit and hemoglobin tests, red cell count and specific gravity determinations; from which alterations in the composition of the blood as regards relative volumes of plasma and corpuscles, as well as estimations of relative changes in the total volume of blood, were made; estimation of the total blood contained in the vessels of the alimentary canal and in the vessels of the liver; viscosity and depression of the freezing point of blood; and temperature and condition of the general reflexes, i.e., the knee, eye, etc. Comparative studies were made on conditions observed in shock, and conditions following the induction of cerebral anemia. The effects of remedial measures were observed, as mechanical increase of cerebral pressure by occluding the aorta; elevation of the posterior portion of the animal to facilitate return of blood to the heart; and administration of drugs, including epinephrin, tyramin, atropin, sodium bicarbonate, lactic acid, and inhalations of carbon dioxide.

The author attributes the earlier stages of the condition termed shock, observed in his experiments, largely to degradation and fatigue of the bulbar centers due to ether poisoning and to sensory nerve stimulation; and the more profound stages to inadequate circulation to meet the bulbar tissue demands. Though all of the blood circulatory phenomena are closely related and interdependent, perhaps the lowest capillary pressure and hence the sluggish return flow of blood to the heart, rather than venous dilatation, is a more comprehensive standpoint from which to picture the condition in shock. Among probable early derangements augmenting the condition, he states, are vasomotor changes affecting the venous tone.

Treatment when instituted in the earlier stages yielded good results; in later stages, results were less satisfactory, owing presumably to irreparable injury to the central nervous system.

Therapeutic measures capable of restoring an adequate cerebral circulation, instituted before irreparable tissue injury had occurred, led to recovery. Such measures, Guthrie states, should be preferably of a mechanical nature, as elevation of the posterior parts of the body, with the view of increasing a return of blood to the heart and adding a hydrostatic factor to the cerebral blood pressure; increase of peripheral resistance as by aortic compression; and, particularly when associated with severe hemorrhage, increase of blood volume by transfusion of blood or the intravenous injection of isotonic nontoxic solution, as sodium chloride.

Theoretically and from the standpoint of increase in blood volume only, injection of hypertonic solutions would be indicated. The recent observations of Sansum on the marked increase in arterial blood-pressure associated with and following intravenous injection of strongly hypertonic glucose solutions he considers very suggestive.

Temperature, if low, should receive attention, but the main indication is promptly to institute and to maintain an adequate cerebral circulation.

In the case of drugs, the best results have been obtained with epinephrin solution intravenously. Drugs were selected with the view of increasing the peripheral resistance and augmenting the return of blood to the heart by direct action on the blood-vessels.

Guthrie believes that these considerations of treatment, with added considerations to meet the psychic factor, apply to shock in man. For example, in acute psychic shock, inhibition probably plays a leading rôle. In the series of experiments reported in the present paper there was little evidence that inhibition was a factor.

GEORGE E. BULLBY.

Erlanger, J., and Woodyatt, R. T.: Intravenous Glucose Injections in Shock. *J. Am. M. Ass.*, 1917, LXIX, 1410.

On theoretical and experimental grounds supported by some clinical evidence, it would appear that intravenous injections of glucose at appropriate rates are of distinct benefit in certain phases of shock.

Glucose injected intravenously at rates varying between 0.57 and 4 gm. per kilogram per hour for from 20 to 60 minutes into anesthetized dogs reduced to a state of shock by partial temporary occlusions of the inferior cava or aorta has been observed uniformly to increase the mean arterial pressure.

The injections have uniformly produced a marked increase in the pulse amplitude, indicating a condition of plethora. The increase in pulse amplitude has usually been more striking than the increase in arterial pressure. In one case the increase in pressure determined by the injection of glucose continued after the cessation of the injection until the pressure was approximating the normal.

A subtolerant dose has raised the arterial pressure and increased the pulse amplitude as effectively as many of the injections made at more rapid rates. With the more rapid injections, a marked hemorrhagic tendency may develop in animals in this condition. No other palpable deleterious effects were observed.

EDWARD L. CORNELL.

Bayliss, W. H.: Treatment of Shock by Intravenous Injections (Le traitement du choc par les injections intraveineuses). *Arch. méd. belge*, 1917, LXV, 793.

Bayliss refers to states of shock especially characterized by lowering of the arterial pressure. In hemorrhage the most logical treatment is to replace

the lost blood. In the fluid employed two properties are indispensable, i.e., viscosity, and the osmotic pressure of colloids. In animal experiments the author has found that if the blood-pressure be reduced by the extraction of a certain quantity of blood, the pressure is only partially re-established if the same quantity of Ringer's solution be injected.

However, if 6 per cent of gum arabic be added to the solution, the blood pressure is completely re-established. Other substances such as gelatine give the desired viscosity to the solutions, but for various reasons they are not so suitable as gum arabic. Moreover, a 6 per cent gum arabic solution has the same osmotic pressure as blood. The œdema which is usually manifested sooner or later with the use of Ringer's solution alone does not occur when the gum arabic is added to it. The gum arabic is easily sterilized by boiling. A 4 per cent solution of gum with 0.9 per cent of chloride of sodium has been found excellent for experiments with cats and a concentration of 2 per cent has been successfully employed in man. No anaphylactic effects have followed the use of gum in animal experiments.

The author considers the use of the solution in shock due to conditions other than hæmorrhage, where there is strong concentration of the blood.

W. A. BRENNAN.

Amberg, S., Loevenhart, A. S., and McClure, W. B.: **The Influence of Oxygen upon Inflammatory Reactions.** *J. Pharmacol. & Exp. Therap.*, 1917, 8, 209.

The authors conclude that intravenous injections of the sodium salts of O-iodoso and O-iodoxy benzoic acids inhibit the mustard oil reaction of the rabbit conjunctiva as well as that of the skin. No other visible changes in the organism accompany this inhibitory action. Other substances containing chemically active oxygen such as the sodium salts of diphthallic peroxide, iodic and periodic acids have an inhibiting action on the mustard oil inflammation.

It seems reasonable to ascribe the inhibiting action of these substances to the chemically active oxygen. Exposure of rabbits to atmospheres with reduced partial pressure of oxygen did not have any marked effect on the intensity of the intracutaneous mustard oil reaction. Intravenous injections of sodium cyanide seem capable of intensifying the conjunctival mustard oil reaction under proper conditions. Within certain limits an influence on tissue oxidation seems to determine an inhibition or intensification of the response to inflammatory stimuli. It seems possible to alter the character of the conjunctival mustard oil reaction by intravenous injections of substances such as sodium hypochlorite. Irritation produced elsewhere in the organism, as by intraperitoneal injections of kaolin, animal charcoal, and mustard oil, may exercise an inhibiting influence on the conjunctival mustard oil reaction of the rabbit.

MAX KAHN.

Kermissoon, E.: **Infantile Surgery.** *Med. Press & Circ.*, 1917, CIV, 379.

The author reports two cases of Meckel's diverticulum, one in a boy of fourteen who was admitted as a case of appendicitis. The contrast was marked between his excellent general state and the distention of the abdomen, which suggested an intestinal obstruction. On opening the abdomen a large quantity of yellowish serum escaped. The cæcum came into view and could only with difficulty be drawn out, being strongly adherent farther down. The appendix, which ran in the direction of the true pelvis, was resected.

The index finger, passed down toward the brim of the pelvis, felt a mass of intestinal loops, bound together by a constricting band. A Meckel's diverticulum was found measuring 7 or 8 cm. in length, the caliber of the small intestine. It was attached to the free edge of the latter, some 20 cm. above the ileocæcal angle. From the top of the diverticulum ran a fibrous band containing an artery and two veins, the other end of which was inserted into the free edge of the intestine a few centimeters above the point of implantation of the diverticulum. In the loop thus formed a piece of small intestine was fixed, but was not very tightly constricted. The band was divided between two ligatures, but in view of the size of the diverticulum it was not resected in order not to unduly prolong the operation. The sequelæ were uneventful and the patient left the hospital in a few days.

Two months later the patient was seized with pain in the abdomen. Bowel movement was accompanied by sickness. On the strength of the information gained at the previous operation, it was decided to open the sheath of the right rectus muscle. Some loops of intestine bound together by adhesions were discovered. After breaking down these adhesions, the diverticulum itself was recognized in one of these very adherent and congested loops. After freeing it from its adhesions, it was pulled outside the abdomen with aseptic gauze. A forceps guarded with rubber tubing was applied to the base of the diverticulum, which was crushed close to its point of insertion, and was then divided with the electric thermocautery. A continuous suture was run around the edges of the divided gut and over this a seromuscular Lembert suture. The various adhesions that had been divided were tied with fine catgut. The peritoneum was carefully cleansed from blood and serum and the walls were sutured in three layers after placing in position a drain to be left 48 hours. Recovery was uneventful and the patient left the hospital in four weeks.

The second case, that of a male infant eight months of age, in good general health, was brought in with a stercoral fistula of the navel. The fistulous orifice rested upon a small, rounded tumor of a bluish-red color, which, when the child cried, increased notably in length in consequence of the prolapse of the intestinal mucosa. The child was operated upon, beginning by the application of a ligature around the base of the tumor in order to

prevent the escape of faeces. After disinfecting the skin, an elliptical incision was made around the tumor. The diverticulum was then gently drawn outside the abdomen, together with the small intestine to which it was adherent. It measured about 3 cm. in length and was inserted, not on the convex border of the intestine, as is usually the case, but close to the mesenteric border. Resection was done with the thermocautery after ligation with catgut; the stump was buried by the aid of a silk suture passing through both the intestinal wall and the layer of mesentery. The child recovered without incident and was discharged in a fortnight. A month later he was in excellent health with a sound cicatrix.

EDWARD L. CORNELL.

SERA, VACCINES, AND FERMENTS

Bohan, P. T., and Lynch, L. A.: A More Delicate Wassermann Reaction Depending on the Use of Increased Quantities of Blood Serum. *J. Am. M. Assn.*, 1917, lxi, 1020.

This report is based on observations made on 200 patients examined serologically for evidences of syphilis, over a period of one and one-half years. The authors have attempted to develop a Wassermann technique which would agree in a larger percentage of cases with the clinical diagnosis of syphilis and which would enable investigators to attach some significance to the negative Wassermann reaction.

Their method consisted essentially in the use of graded increasing amounts of blood serum and spinal fluid, each serum being tested in the following amounts: 0.1 ccm., 0.3 ccm., 0.5 ccm., and 1 ccm., while amounts of spinal fluid as high as 10 ccm. were used in a single test.

Their investigations showed that as much as 1 ccm. of serum might be safely used and that a negative reaction with 0.1 or 0.2 ccm. of serum was of little or no value in excluding syphilis in the latent or inactive stage such as locomotor ataxia. In the cases reported by the authors which required the use of increased amounts of serum to obtain a positive reaction, the diagnosis of syphilis was made by other means, such as a history of chancre, clinical findings and tests of the spinal fluid. In fact, in every case giving a positive reaction when 1 ccm. was used they obtained positive findings in the spinal fluid, such as a positive globulin test, a typical colloidal gold chloride test, and a positive Wassermann reaction when a sufficient amount of fluid was used. However, they seldom found it necessary to use more than 3 ccm. of spinal fluid.

In conclusion, the authors found that with larger quantities of serum a higher percentage of positive reactions was obtained, and with this technique, if the serum was fresh, 1 ccm. was not more anti-complementary than smaller quantities. Normal serum did not cause complement fixation when 1 ccm. was used. Their investigations corroborated the statement by Lange that in non-syphilitic cases

negative reactions were obtained in the spinal fluid with 10 ccm.

A negative reaction with an increased quantity of serum did not positively exclude latent syphilis. In 4 per cent of known syphilitics there was no inhibition of hemolysis when 1 ccm. of serum was used.

A Wassermann test made with graded quantities of serum is not only an index of the activity of the syphilitic process but is of value in indicating the progress of the case under treatment.

GEORGE E. BITLEY.

Emery, W. D.: The Retraction of Blood-Clots, with Two Methods for Securing a Large Yield of Serum. *Lancet*, Lond., 1917, cccii, 507.

Blood collected from the living body in a non-living vessel clots after a longer or shorter time; at first the clot is a uniform, soft mass. After a period which varies from a few minutes to several hours, it usually begins to contract, and in doing so leaves a larger or smaller amount of serum, mixed in most cases with red corpuscles and leucocytes. This serum makes its appearance between the clot and the sides of the vessel and on the surface of the clot. The clot is heavier than the serum and tends to sink, so that when the process is completed it forms a dark purplish mass of the shape of the containing vessel, lying at the bottom of a greater or smaller amount of serum.

In the first stage of coagulation a fine network of filaments of fibrin is formed, enclosing within its meshes serum, red corpuscles and leucocytes. In the second stage each filament tends to contract, the serum and some of the red corpuscles are squeezed out, and a firm mass of fibrin containing a relatively small number of red corpuscles is left, the leucocytes making their way through the clot by their own active movements.

The effect of this contraction of the fibrin filaments differs in the center and periphery of the clot, the retraction beginning at the periphery, either at the sides of the vessel or on the surface of the clot. The serum which appears on the surface of the clot is usually turbid from red corpuscles, while that appearing between the clot and vessel wall is quite clear because of the settling of corpuscles.

There are factors which cause a difference in the retraction of different clots; some retract quickly and give an abundant crop of serum, and others retract slowly, giving a smaller crop, or fail to retract at all. Internal factors are those which differ in different specimens of blood. External factors are the size and shape of the containing vessel, the nature of its walls, the temperature and gravity. The force tending to draw the clot away from the surface is largest in small tubes, getting progressively less in large tubes.

In conducting his experiments the author has used human blood drawn directly from the veins into a tube lined with paraffin, in which it remained unclotted for a sufficiently long time to permit the

experiments to be made and measurements to be made when necessary with paraffined pipettes.

The experiment was conducted by dividing the same specimen of blood into tubes of the following diameter: 1 mm., 4 mm., 9 mm., and 17 mm., at room temperature. In 1 mm. tubes retraction was abundant in half an hour and the yield of serum was 30 to 50.6 per cent. In 4 mm. retraction was noticeable at the end of an hour, with a yield of 29.2 to 30.7 per cent of serum in twenty-four hours. In the 9 mm. tubes there was but slight retraction at end of four hours, with a yield of 6.3 per cent to 21.5 per cent serum in twenty-four hours. In the 17 mm. tubes no retraction occurred in twenty-four hours and there was no serum.

The author states that blood collected in capillary tubes always contracts completely, yielding the full theoretical amount of serum. In most cases it commences in less than fifteen minutes and is complete in one-half hour. In tubes having a diameter of 3 to 4 mm. retraction generally takes place and is usually complete but occasionally is only partial and is much slower than in capillaries. In Wassermann tubes retraction is the rule but there are occasional exceptions; action is much slower and not complete as a rule in less than from twelve to twenty-four hours. In large test-tubes it is frequently absent, always slow and often incomplete.

In general, the newer and cleaner the vessel the easier and quicker is the retraction. A clot will not detach itself from a paraffin-lined tube. The author does not think that a clot formed in a living vein retracts from the walls, never having seen an example in sections of thrombosed veins.

If a freshly formed clot be suspended in air, the process of expression is very rapid, the contraction of the fibrin being assisted by the force of the serum; but if the clot remains in the serum this assistance from gravity is very much less. In narrow test-tubes the clot remains adherent by a rim of attachment at its upper angle of contact with the wall of the tube. Retraction always begins at some point on the side and continues until every point except this rim of attachment has detached itself from the wall. Such a clot has a wide top, a narrow neck and a wider base, which is often almost as wide as the tube and may in some cases be almost spherical. The shape is due to the action of gravity on a soft mass, originally cylindrical, which is lifting itself up by the contraction of its surface membrane.

When the clot is first formed it has a specific gravity of 1.056. As soon as retraction commences some of the serum, which is lighter (sp. gr. 1.030), escapes. As the clot shrinks, specific gravity rises, ultimately reaching almost 1.100.

In large vessels the rim of attachment will not hold, and the clot sinks to the bottom. This is because the length of the rim increases only proportionately to the diameter of the vessel, while the weight of the clot rises in proportion to its cube. Gravity assists in that the upper part of the clot presses on the lower and tends to press out the serum,

but the conditions are much less favorable, for the clot may be pressed against the walls of the vessel and the serum be prevented from escaping; also the compressing force exerted by the upper part of the clot tends to counteract the contraction of the lower part.

The nearer the temperature of the vessel to that of the body, the quicker and more complete will be the retraction. Retraction is hastened at incubator temperature. In an ice-chest retraction is usually absent or very slight in anything larger than a capillary tube, and may be incomplete in these. A point of considerable importance is that the temperature to which the blood is exposed when first drawn is of chief importance in determining the rate and completeness of retraction. In order to collect as much serum as possible, the blood should be collected in warmed tubes and incubated as soon as possible. After an hour or two it may be kept at room temperature, but the ice chest should be avoided until retraction is complete.

There are two methods for obtaining a very full crop of serum:

1. A test-tube is bent about the middle to an angle of 135°; after it is sterilized a small amount of melted paraffin is poured in, heated, and the tube kept upright until it is cold. When set, the paraffin will form a layer at the bottom of the tube. The tube is filled with blood short of the angle and kept upright in the incubator until coagulation has taken place. Then it is slightly tilted on the side so that the serum may draw into the angle. In a test-tube containing 8 to 10 ccm. of blood retraction will usually be complete in two hours or less and the clot will stick to the paraffined surface of the tube.

2. Another method is to paraffin the side of a flask. The blood is allowed to clot in contact with this surface, the flask being kept on its side. When coagulation is complete, the flask is turned so that the blood is uppermost. The serum will be very rapidly expressed and will form a pool on the opposite side of the flask.

V. C. HUNT.

Nuzum, J. W., and Willy, R. G.: Specific Serum Therapy of Epidemic Poliomyelitis; a Report of 159 Cases Treated with Antipoliomyelitic Horse Serum. *J. Am. M. Ass.*, 1917, lxxix, 1247.

The mode of production, the technique of administration, and the results obtained in a series of 150 cases of epidemic poliomyelitis treated with antipoliomyelitic serum prepared in the horse by injections of the poliomyelitic cocculus are reported. These patients were treated in the Cook County Hospital during the epidemic which prevailed throughout the summer and autumn months of 1917 in Chicago.

The authors point out that the detection of neutralizing substances in the blood serum of both monkeys and human beings following an attack of poliomyelitis, and the observations of Flexner and Lewis on the protection of inoculated monkeys by means of injections of serum of recovered monkeys

apparently has furnished the basis for serum therapy in man. Netter and several others have reported favorably on the treatment of poliomyelitis in man by injections of immune serum from convalescent patients. Unfortunately, however, there would seem to be several disadvantages attendant upon this method. Chief among these is the difficulty in securing serum in sufficient quantity properly to treat any considerable number of patients; and still more important is the probable low antibody content of human serum as compared with an immune serum produced in the horse by injections of the causative micro-organism.

The authors found it possible to identify the coccus by the use of immune horse serum, employing the dilution method for estimating the point of opsonic extinction. This reaction was specific for the poliomyelitic coccus. They have recently shown that repeated intravenous injections of the coccus in the horse produce an immune serum rich in agglutinins, complement fixation bodies, and especially opsonin; and such a serum has been shown to possess protective and curative properties against fatal doses of virulent virus in experimental poliomyelitis in monkeys.

The authors describe the method employed for the immunization of the horse and preparation and demonstration of the serum, as well as an analysis of a series of ten cases treated by intraspinal and intravenous injections of the immune serum produced by injections of the poliomyelitic coccus in sheep.

As a result of this study, the authors present the following summary of their work:

Of 136 patients receiving serum in all stages of the disease, 16 died, a mortality of 11.9 per cent. Among 100 cases occurring during the same period of time, in which the patients did not receive serum, 38 patients died, a mortality of 38 per cent.

Altogether, 132 patients in all stages of infantile paralysis were treated, excluding 7 cases presenting respiratory paralysis on admission with 11 deaths, a mortality rate of 8.3 per cent. During this same period of time a total of 301 cases were reported to the Health Department with 97 deaths, a mortality of 32 per cent.

This series of treated cases sufficed to demonstrate the harmlessness of serum treatment when the serum was free from hemoglobin, sterile to repeated cultures, and the injections were slowly made and all known rules of precaution observed.

The serum appeared to possess the power of definitely preventing the onset of paralysis when administered early in the disease. In 10 undoubted instances of poliomyelitis in which no paralysis was detected at the time serum was administered, prevention of paralysis and complete recovery resulted in 100 per cent.

The action of the serum was more definite in arresting the extension of paralysis and diminishing the severity than in effecting its disappearance. As in other acute infectious diseases, the earlier the

serum was administered, the more striking were the results obtained.

Serum should be injected intraspinally in small doses and at the same time intravenously in larger amounts. Temperature should be employed as a guide to the dosage. The injection of serum was followed by a critical fall in the patient's temperature. Coincident with this there occurred a slowing of the pulse-rate, and other definite clinical evidence of general improvement.

In doubtful early cases the decision to use serum should rest on the bacteriologic, chemical, and microscopic examination of the cerebrospinal fluid.
GEORGE E. BERRY.

Wayson, N. E.: Prophylactic Use of Vaccines in the Great War. *J. Am. M. Ass.*, 1917, LXX, 227.

One of the precise aggressive weapons is that which gives rise to immune substances in the body, namely, the antigen. To conserve the immunogenic qualities of the organism involved and to institute the destruction of their infectivity has necessitated the use of dead or greatly attenuated bacteria. This has been variously accomplished by heating, by chemicals, chiefly phenols and ether, by autolizing, and by sensitizing with immune serum. The dosage in general vogue varies from 1,000 million to 4,000 million bacteria and the intervals vary from five to eight days. It is the opinion of several authors that three doses at most and frequently two inoculations are as effective as four or more.

There is a growing tendency to increase the initial dose, partly on account of the irregularities due to military exigencies, and partly on account of the results of experimental work which show that the success of the vaccination varies directly with the mass of the vaccine. The present practice is to revaccinate every eight to twelve months. The severe reactions, as well as the complications, can largely be avoided by attention to contraindicatory signs such as fatigue, conditions prodromal to acute infections, and organic, respiratory, renal, or circulatory involvements.

There is now sufficient evidence to show that the morbidity and mortality are greatly decreased where protection is not afforded by the vaccination. The modification of the course of these intestinal infections has produced many "carriers" and has thereby created an additional problem for both military and civil communities.

The method of triple immunization in cases of typhoid and paratyphoid has been found efficient in the Japanese experience, and the reaction from the mixed vaccine is little greater than from the typhoid alone.

Anticholera vaccination has been administered in two doses and has been accompanied by less reaction than typhoid vaccinations. The immunity is more evanescent, necessitating re-inoculation in three to four months. Antidysentery vaccination, but slightly practiced, has given no convincing results.

GATEWOOD.

Culver, H.: Antibodies in Gonococcal Arthritis After the Intravenous Injection of Specific and Non-Specific Protein. *J. Lab. & Clin. Med.*, 1917, 10, 12.

Primary and secondary proteose preparations stimulate antibody production or mobilization for specific organisms in gonococcal arthritis in a manner not to be distinguished from that produced by the injection of the specific organisms themselves. In gonococcal arthritis there is either no change or a decrease in the antibody content of the serum within the first twenty-four hours following an intravenous injection except in the case of the first injection when the lytic substances seem to be slightly increased during this time.

In favorable patients the first injection usually causes the greatest clinical benefit. It would seem that there is no one particular factor which is responsible for the benefit derived in favorable patients, but a series of events occur which, when acting together or in succession, tend toward the relief and ultimate recovery of the individual from the infection.

MAX KAHN.

BLOOD

Kerley, G. G.: The Treatment of Secondary Anæmia in Infants by Blood Transfusion. *Am. J. Obst.*, N. Y., 1917, lxxvi, 713.

The author reports eight cases of blood transfusion because of simple secondary anæmia or because of anæmia and malnutrition. The blood was usually obtained from the father or mother after physical fitness was demonstrated by the absence of agglutination and hæmolysis.

The technique was simple; blood was withdrawn from a vein of the donor into a syringe and injected directly into the vein of the infant. The syringe was washed out with sterile salt solution before being refilled with blood.

The results in all cases were satisfactory with one exception. In one case, a second transfusion was done, after a thirty-day interval.

The children were all under two years of age. Marked improvement in the digestive capacity and general health was noticed.

W. L. BROWN.

Depage, A., and Govaerts, P.: The Hematologic Indications for Immediate Transfusion Following Injury (Les indications hématologiques de la transfusion immédiate dans les premières heures après une blessure). *Bull. et mém. Soc. de chir. de Paris*, 1917, xliii, 1873.

The authors made a systematic hematologic study of 47 cases of severe limb injuries, such as fractures, vascular wounds, etc. Thirty-two cases examined in the first six hours following injury showed more than 4,000,000 red globules per cubic millimeter of blood. By the third day the posthemorrhagic anæmia reached from 2,400,000 to 3,000,000. Four of these cases died, 2 of acute infection, 2 from true hæmorrhage. Fifteen cases examined under

aseptic conditions showed less than 4,000,000 red globules. Fourteen of these died from hæmorrhage in less than twenty-four hours.

The authors therefore conclude that it is a symptom of an almost surely fatal hæmorrhage if in the first six hours after injury the red count in the venous blood descends below 4,000,000. In such cases the injection of artificial serum is impractical, and under the circumstances a blood transfusion is absolutely indicated.

These results apply only to fractures. In visceral lesions there are other factors, and the results of blood analysis are more delicate. The figures apply only in the case of adults in good general condition, such as soldiers. The authors take the following as indicative of a severe hæmorrhage and calling for blood transfusion: less than 4,500,000 red corpuscles in the first 3 hours after injury; less than 4,000,000 red corpuscles in the first 8 hours after injury; less than 3,500,000 red corpuscles in the first 12 hours after injury.

The authors exhibit a tabular statement of 14 cases treated by transfusion. Three of these patients died from acute infection which had set in shortly after injury. Among the 11 others there were 8 complete successes. One of the failures was due to hæmoglobinuria and the two others were due to an insufficient amount of transfusion. In desperate cases this quantity should be doubled.

W. A. BRENNAN.

Saneyoski, S.: The Viscosity of the Blood in Experimental Anæmia (Ueber Blutziskosität bei der experimentellen Anæmie). *Mitt. a. d. med. Fakult. d. k. Univ. zu Tokyo*, 1917, xvii, 401.

Subcutaneous injections of phenylhydrazin were made in rabbits for the purpose of producing anæmia and studying the viscosity of the blood and its effects. The author finds as the result of these experiments that though the blood viscosity fluctuates principally according to the number of blood corpuscles and the hæmoglobin and gas contents, yet high viscosity values occur during anæmia with relatively few number of blood corpuscles and small hæmoglobin content. This relative increase in the blood viscosity is especially noticeable in rabbits rendered anæmic with phenylhydrazin.

One of the principal causes is a certain substantial change in the erythrocytes. The change is demonstrable from the sediment in hæmolysis and from the marked tendency of the erythrocytes to appear agglutinous in progressive anæmia.

Cases exist, moreover, where the plasma viscosity, which as a rule is almost constant, is increased, causing in turn a distinct increase in the total viscosity of the blood. Finally, cases occur where the total viscosity is increased though neither erythrocytes nor plasma have had any influence upon the viscosity increase.

Whether the viscosity increase is to be considered as a real compensatory process in the mechanism

of the circulation disturbed by the anemia or merely as an accompaniment of other important symptoms of anemia cannot be definitely stated.

The impression is given that the organism undergoes no decided deviation from the normal on account of the change in the blood viscosity. But the tendency is to obtain a return to normal viscosity as long as the organism possesses reactive force. This accords to a certain extent with the ideas of Frommsdorf, Heubner, Determan, etc., who have emphasized the importance of the degree of viscosity of the body fluids for the process of life.

W. A. BRENNAN

Morse, J. L., and Wohlbach, S. B.: A Case of Pernicious Anemia in a Boy of Eight Years. *Am. J. Dis. Child.*, 1917, xiv, 301.

The author presents in full the history of a boy eight years old, suffering from pernicious anemia. The diagnosis seemed very positive, although no cause could be determined. Addison's disease was suggested by the discoloration of the skin, but the absence of a profound muscular weakness, normal systolic pressure and apparently elevated temperature, showed that there was no adrenal insufficiency. The pigmentation, moreover, could be explained as the result of blood destruction.

The enlargement of the heart, murmurs over the heart and in the neck, high pulse pressure and other evidences of aortic deficiency appeared not to be due to organic disease, but to muscular weakness and vasomotor insufficiency.

Neurology was performed December 12. A detailed report of the findings justified the clinical diagnosis of pernicious anemia. With the exception of round worms, which were found in the intestines, nothing was shown as a possible cause of the disease. It appears improbable that the worms were the cause of the severe anemia. No ova were found in the feces on repeated examination.

E. C. ROBITSCHK

BLOOD AND LYMPH VESSELS

Marmatine, H.: Arterial Wounds Without External Hemorrhage and Their Surgical Treatment (les plaies artérielles sans hémorrhagie externe et leur traitement chirurgical). *Lyon (chirurg.)*, 1917, xiv, 137.

The arterial lesions observed in war may be placed in two categories: those in which considerable external hemorrhage is immediately manifested, and those without external hemorrhage, the so-called dry vascular injuries. The author deals with the latter variety, 32 cases of which he has observed and operated upon.

The author treats the pathological anatomy and physiology, the symptomatology and treatment at length. The clinical types are conformable to the anatomic types and are divisible into three groups: (a) those showing symptoms of arteriovenous fistula;

(b) arterial wounds or arteriovenous wounds with diffuse hematoma; (c) traumatic aneurysm.

The 32 cases observed by the author comprised 6 traumatic aneurysms; 3 arteriovenous fistulae, 21 arterial or arteriovenous wounds with diffuse hematoma. There were 30 recoveries, 2 deaths, and 1 secondary amputation.

The technique consists in ligation of the vessels above and below the injury, resection of the aneurysmal sac or of the intermediate segment, evacuation of the hematoma, liberation of the nerves, etc. Each of these steps is described in detail.

The author emphasizes the necessity of early operation, which should be performed before the formation of an aneurysm; the importance of the minor symptoms which often reveal the existence of a vascular injury; and the necessity of acting by direct operation at the site of the vascular lesion and not by a distant ligation.

W. A. BRENNAN

Ochsner, A. J.: Varicose Veins of the Leg. *Surg. Clin. Chicago*, 1917, I, 917.

Ochsner performs the Nussbaum operation for the varicose ulcer. This is an incision that encircles the ulcer at a distance of 2 cm. from its margin; all veins are ligated and the incision united with horse-hair sutures. Then the Mayo operation is usually performed. A small incision 6 cm. above the internal aspect of the knee is made, exposing the internal saphenous vein, ligating doubly, threading the distal end through a Mayo vein stripper, and forcing the vein stripper down the leg to the vicinity of the external malleolus. Here a small incision is made, and the vein which has been separated is removed.

In more severe cases especially if there are several masses of varicose veins along the anterior surface of the leg, it is necessary to make a long incision and dissect out the masses *en bloc*, all veins being ligated carefully.

As a further assurance that all the veins are divided, Ochsner does in addition the Schede operation, which is a spiral incision of the leg. All veins are ligated as they are divided. A bridge of skin of at least 3 cm. should be left between the spirals. All the incisions are then sutured, a snug bandage applied, and the leg kept in an elevated position of 45 degrees. After the wounds have healed, which requires about two weeks, the leg is encased in a Unna's paste cast. This can be left on for from six to fourteen weeks. In some cases in which the veins are not much enlarged but an ulcer is present, the limb is kept elevated and moist boric acid applications are made until the ulcer appears healthy, at which time a skin graft is done. Ten days or two weeks later a Unna's paste boot is applied, leaving a window at the site of the graft.

In other non-operative cases a paste boot is applied and renewed as necessary. The results are better than with the use of an elastic bandage.

J. J. KRIEGER

Flessinger, N., and Clogne, R.: The Proteolytic Power of the Normal Polynuclear Leucocytes of the Circulating Blood. (*Étude sur le pouvoir protéolytique des leucocytes polynucléaires normaux du sang circulant*). *Ann. de med.*, Par., 1917, IV, 445.

The proteolytic index of polymorphonuclear leucocytes has been studied but only with regard to the leucocytes contained in pus. So far as the authors know, a similar study has not been previously made with regard to the proteolytic power of normal leucocytes in the blood stream. The authors have made such a study and review their findings thus:

1. Whatever proteid matter may be used, when the emulsion of leucocytes has reached the boiling point, the amount of nitrogen-formalin produced is nil or is not enough to be taken into account.

2. The amount of amino-acids produced is proportional to the concentration in weight or volume of albumin in the proteid solution.

3. The amount of nitrogen-formalin produced is proportional to the number of polymorphonuclear leucocytes in the test tubes. The progression is not regular and is not so marked in strong concentrations as in weak concentrations. The amount of nitrogen-formalin varies in inverse ratio to the concentration of the leucocytes.

4. Proteolysis takes place progressively between the twenty-fourth and forty-eighth hours. Vapors of formaldehyde, toluol and chloroform do not interfere with the diastatic activity, as is the case when the emulsion of leucocytes has been kept for a long time in 90 per cent alcohol or when it has been heated above 60° C.

5. There is no appreciable change in the activity of the proteolysis during the period of digestion of the individual.

6. There is a considerable decrease in the proteolytic activity of leucocytes during the restoration stage in anemia secondary to hæmophilia.

7. Tests show that the amount of non-coagulable substances increases proportionally to the number of leucocytes.

W. A. BRENNAN.

POISONS

Scalone, I.: Some Cases of Malignant Non-Gaseous Gangrene (Note su alcuni casi di edema maligno non gaseoso). *Policlin.*, Roma, 1917, XXIV, 102, *chir.*, 433.

From the Italian war front Scalone reports 5 personal cases of gangrene consecutive to gunshot wounds which do not correspond with the classic picture of gaseous gangrene. These are malignant oedematous cases which in the early stages show neither gas bullæ nor signs of gangrene. The five cases had certain similarities: (1) Severe infection developed in relatively slight injuries; (2) the wound in all cases involved the muscular tissues, producing severe bruising and injury; (3) the wound was necrotic, with detritus and putrid exudations; (4) oedema was the most constant and important

symptom; (5) there was absence of the production of gas; (6) gangrene was not a constant symptom.

The oedema was hard and diffuse extending from the periosteum to the skin; the skin was of a whitish porcelain color. Gangrene was entirely absent in two of the cases and in one case was local and circumscribed. In all 5 cases death occurred suddenly after symptoms of heart failure; the condition, although grave, gave no previous indication of an impending catastrophe.

The author made bacteriological examinations in these cases and the findings appear to correspond to those described by Sacquepée as predominant in the special form of gangrene known as malignant gaseous oedema. Scalone describes the condition as an acute infection of malignant character with a fatal prognosis, the earliest manifestation of which is oedema. It cannot be considered as gaseous gangrene, and appears to be more nearly a white erysipelas. The term non-gaseous malignant oedema might justly be applied. Such cases are much less numerous than those which correspond to the classic gaseous gangrene; but the classification of gangrene should commence with this non-gaseous form. It is very probable that further investigation will show that a different microbic agent corresponds to the different clinical types of gangrene.

The author was able to save the life of one patient by an early amputation of the thigh. The other four patients died. In similar cases he recommends early amputation before the second or third day. Wide opening up and stripping of the wounds gives no result.

W. A. BRENNAN.

Douglas, S. R., and Colebrook, L.: Studies in Wound Infections; the Growth of Anaerobic Bacilli in Fluid Media Under Apparently Aerobic Conditions. *Lancet*, Lond., 1917, cxciii, 530.

The author reports a series of experiments in which anaerobic organisms were grown under practically aerobic conditions. It has been known for some years that the addition of a piece of animal or vegetable tissue to fluid media has a beneficial action on the growth of anaerobic bacteria.

Tarozzi first pointed this out and used small pieces of kidney or testicle. Ori and Wrzosek used pieces of vegetable tissue. Wright and Dreyer used tubes of broth to which a piece of potato had been added previous to sterilization. It was found that anaerobes would grow, even if a stream of oxygen were passed through the fluid portion of the media. The general explanation given was that the animal or vegetable tissue contained some body which acted as a reducing agent.

The authors repeated the experiments and obtained the same results as other investigators, but they experimented further and found that anaerobes could be grown if carrot, cabbage, grapes or bran were added. It was thought that possibly some food substances such as vitamins might be given up which enabled the anaerobes to proliferate. To

verify this, experiments were made in which an alcoholic extract of brain was added to the broth both directly and with saturated filter paper. The results were conflicting, but it was found that the best growth was obtained where a considerable amount of the solid extract was added; growths equally abundant were found in the control tubes where untreated filter paper was added. The idea was then abandoned that the growth was due to any food substance.

A series of experiments was then carried out in which various inert substances were used instead of vegetable tissue: asbestos wool, cotton wool, lint, sponge, charcoal, chalk, cork, sand, cardboard, blotting paper, khaki cloth and a rusty nail. The results showed that any form of inert substance rendered the media suitable for the growth of anaerobic organisms without any further precautions; the explanation was that the organisms are lodged in the meshes of the inert substance and are there able to produce anaerobic conditions locally, the growth gradually extending through the substance.

Other experiments showed that the amount and consistency of the substance used has direct bearing on the growth. Proof was further made that the bacilli would also grow in fine capillary tubes. It was shown by the use of aqueous solution of methylene blue in glucose broth that anaerobic bacilli are able to absorb oxygen rapidly or else to produce a reducing substance. It was also found that anaerobic bacilli will grow more rapidly and also form a smaller implantation if in addition to the usual anaerobic conditions some porous substance is added.

C. A. BOWERS.

Zinsser, H., and Parker, J. T.: *Bacterial Anaphylaxis and Infection*. *J. Exp. Med.*, 1917, XXVI, 411.

An analysis of bacterial anaphylaxis and its relation to the occurrences in the animal body during an infectious disease has been attempted. The authors showed that the sensitization of the tissues of guinea pigs, as indicated by the isolated uterus, required from three to five days even when passive sensitization was employed, and that conditions with bacterial sensitization were entirely analogous to those revealed for serum anaphylaxis by Dale and Weil. It became apparent that the sensitized uterus reacted not at all with whole bacteria or whole red cells; in other words, before reaction with sensitized organs took place an extraction or solution of the bacterial cell occurred. That bacteria would yield some of their substance to the circulating blood during the course of infection was expected, but it was definitely indicated by the complement fixations.

The mechanism of injury in the sensitized animal, or in the human being so far advanced in typhoid fever that antibodies have begun to develop, is in part one in which antigen derived from the bacilli and brought into suspension in the blood stream reacts with antibodies which are from the beginning or subsequently become integral parts of the cell protoplasm, the entire process taking place within

the cell. This last point is indicated by the failure to sensitize by simply soaking the normal uterus in antiserum.

This, however, cannot be the entire story of injury. It is known that typhoid antigen injected into normal animals in moderate amounts will render them gradually sick and eventually kill them. Also, a sufficient amount injected into a normal animal will occasionally produce acute symptoms in every respect similar to the reaction produced in sensitized animals by smaller doses. The authors have shown that such acute symptoms in normal animals were not due in any degree to tissue sensitiveness, since even large quantities of antigen produced no response on the part of the normal uterus. They therefore consider reasonable the supposition that the injury, gradual or acute, in the normal animal is in no respect referable to tissue sensitiveness to the whole antigen, but rather must be referred to some series of phenomena which occur in the circulation. The acute shock of normal animals may possibly be due entirely to an intravascular reaction. Whether this reaction is one of antigen-splitting or of anti-enzyme removal is a point on which the experiments threw no light.

The authors have not succeeded in producing acute toxic symptoms either in the whole animal or in the isolated uterus by means of serum from animals acutely ill. This is eliminated as negative evidence inasmuch as the toxic substances need at no given time be present in the blood stream in sufficient concentration to render such an experiment successful. They are probably absorbed, and do their injury almost as rapidly as formed, an assumption which is based on the speed with which symptoms develop.

The gradual illness of the normal animal and the occasional acute shock of these animals may be based on entirely different mechanisms, the authors state; at least this possibility cannot be denied on the basis of any experiment which they have been able to devise. In both cases, however, in normal animals the condition seemed to be intravascular. And since the symptoms of acute shock which were produced in sensitized animals with moderate doses were also, though only occasionally, produced in normal animals with larger doses, the authors suppose that the poisons produced intracellularly in the one may be similar to those produced intravascularly in the other. It did not seem probable that the specific circulating antibodies were in any way sources of increased injury to an animal spontaneously infected with bacteria. If sufficiently powerful at the beginning they prevented tissue injury, first by increasing phagocytosis, then by producing intravascular agglutination, and finally even by removing a part of the antigen from possible reaction with the cell; though in this last respect, the experiments indicated that the antibodies functionated imperfectly. It is more probable that their chief protective action to the sensitized body lay in removing the whole bacteria from the possibility of

intravascular disintegration, which is prerequisite to anaphylactic injury of the tissues of the host.

Tentatively the authors summarize their opinion as to the occurrences in the typhoid-infected body as follows: Early injury was probably due to disintegration of part of the bacteria, in the course of which albumose-like bodies were liberated and following which intravascular reactions resulted in the formation of toxic substances, perhaps by some form of proteolysis. Since the accumulation of bacteria during these stages was relatively slight, this form of injury probably played little part in producing symptoms. The experiment by which acute injury was produced in the normal guinea pig by the sudden injection of several times the lethal dose of partly dissolved bacteria found no analogy in the spontaneously diseased body. At this time the tissues were not sensitive; but as antigen absorption progressed and the tissues were stimulated to react, sensitiveness developed which rendered them much more delicately amenable to injury by direct reaction even with small amounts of dissolved but otherwise unaltered antigen. This process was directly counteracted by circulating antibodies which tended to prevent the bacteria from yielding their antigen to solution by agglutination, by aiding phagocytosis, and to a slight extent even by neutralizing dissolved antigen.

It seemed probable that the symptoms which appeared as the incubation time ended were largely those due to cellular sensitization which probably began before any considerable amount of circulatory antibodies was present. The circulating antibodies seemed to have little or nothing to do with intravascular injury, the ferments responsible for this probably consisting of the non-specific proteases studied by Jobling.

Cure consisted of a gradual checking of growth and final destruction of the bacteria, and the consequent cessation of antigen liberation, but delicate hypersusceptibility persisted for some time after cure and immunity had been established. Just what the relation between tissue hypersusceptibility and immunity is remains a problem for further study.

GEORGE E. BEILBY.

SURGICAL DIAGNOSIS, PATHOLOGY AND THERAPEUTICS

Pyman, F. L., and Wenyon, C. M.: The Action of Certain Emetine Derivatives on Amœbæ. *J. Pharmacol. & Exp. Therap.*, 1917, 5, 237.

The authors draw attention to the fact that emetine has been largely employed for the treatment of amœbic dysentery and has proved to be of great value. It seemed possible to them, however, that some derivative of emetine or one of the other alkaloids associated with it in ipecacuanha might prove to have a relatively greater toxicity to amœbæ than the parent substance. This led to a preliminary survey of the relative action of the alkaloids of ipecacuanha and some of their derivatives on

amœbæ, from which it was also hoped to find some relation between the chemical constitution and the amœbicidal action of these substances.

The amœbicidal action of these compounds was tested by incorporating their aqueous solutions in the medium upon which the amœbæ were inoculated. The medium was an agar mixture Walker's medium, upon which the amœbæ grew luxuriantly when the drug was absent; the amœba was one which had been recovered from water and was of the amœba limax type.

In the first series of tests there was no inhibition of amœbic growth with a dilution of 1:100,000, but four drugs showed complete inhibition and one a partial inhibition with a dilution of 1:10,000.

In the second series the drugs used in the first series were again tested in addition to others. The results obtained divided the substances into three groups:

1. The salts of emetine, cephaeline, N-methylemetine, N-methylcephaline and N-methylemetinemethene were approximately equally amœbicidal.
2. N-Methylemetine methochloride, rubremetine hydrochloride, the hydrochloride B, and noremetine hydrochloride were inferior to those of the first group in amœbicidal action.
3. Psychotrine sulphate was much inferior to the substances of group 2.

GEORGE E. BEILBY.

Colcord, A. W.: The Treatment of Minor Injuries. *Internat. J. Surg.*, 1917, xxx, 312.

In the treatment of minor injuries, a rapid examination is made with a view to three things: (1) to stop hæmorrhage; (2) to combat shock; (3) to relieve pain. For the first the tourniquet or pressure bandage is used. The pain and shock may be relieved by one-fourth of a grain of morphine and one-sixtieth of a grain of atropin. If shock is very severe the patient is placed in a comfortable position on a well-padded operating table. External heat is applied. The wound is not touched, but is first covered with cotton or gauze wet with a 1:2,000 cyanide solution. Strict aseptic conditions are observed regarding instruments, hands, and gown. The skin around the wound is then scrubbed with sterile water and liquid soap, and all hair is shaved from the surface. Foreign bodies and all visible dirt are removed, bleeding vessels are ligated, and shreds of flesh cut away. The wound is then irrigated with hot, sterile water. After covering the field well beyond with sterile towels, the wound is sutured, drained if necessary, and covered with sterile cotton and bandages; if near a joint, a splint is applied. Dressing wet with Oschner's solution or Dakin's fluid is kept over the wound for a few days until all danger of infection is past. Where the wound is deep and large, Dakin's fluid is used according to the Carrel method.

Over six thousand consecutive wounds have been treated with Oschner's solution without infection. The author now uses Dakin's fluid almost entirely and the results are highly satisfactory.

If a finger is badly lacerated, Colcord advises the use of a wooden spatula splint. In the case of the hand, wrist or forearm, a woven wire splint or a white pine splint is advised and the whole forearm put in a sling. If the foot is badly lacerated, he uses a cotton splint; if the ankle, he uses a cotton or wire splint and elevates the leg. When a finger is badly crushed and it is feared that amputation may be necessary, he lays the mangled parts carefully in position on the forearm and splint, and applies constant wet dressings. He does not suture immediately, but keeps the part warm, and places the limb in a sling or puts the patient to bed with the arm on a pillow. He applies sutures from twenty-four to forty-eight hours after circulation is established, then amputates those parts where there is no circulation.

Colcord gives various methods in the use of suture material, together with some hints on bandaging and the treatment of special wounds.

E. C. ROWITZHEK.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Marine, D., and Manley, O. T.: Transplantation of the Thymus in Rabbits; Relation of the Thymus to Sexual Maturity. *J. Lab. & Clin. Med.* 1917, 11, 48.

The authors have attempted to obtain more definite data on the transplantation of the thymus and to study its behavior in relation to sexual maturity and breeding.

The thymus normally undergoes a striking atrophy or involution at puberty. It was well established by Paton and Goodall, Henderson, Calzolari and others, that removal of the gonads before puberty delays thymus involution; that thymus removal hastens sexual maturity in rabbits; and that animals allowed to breed show earlier thymus involution than those not so used.

In the authors' experiments, they removed all the main thymus mass, exposing the gland by splitting the sternum to the third rib except the upper portion of one of the cervical cornua, and transplanted small fragments of 2 to 3 mm. into the subcutaneous tissue of the abdomen. Contrary to the conclusion of Renton that transplants in the subcutaneous tissues did not survive, they found that the thymus can be readily transplanted in this location in sexually immature rabbits. Whether the peritoneal or subperitoneal tissues are still more favorable, as some authors state, they have not yet determined.

As with the spleen, only autotransplants survived. Immediately after thymectomy, as above described, two autotransplants were placed in the subcutaneous tissue of the abdomen of each of 8 rabbits. Each rabbit was between three and one-half and four months old. Six of these rabbits were observed for three months, and the transplants examined directly at monthly intervals. Two females were kept with

one of the males. Examination at the end of the first month showed that both were pregnant, this is earlier than rabbits usually breed. At the gross examination, the transplants in all three seemed negative, though the enlarging breasts made the examination unsatisfactory. One transplant area was removed from each and examined histologically. In one female, there was an active transplant, while in the other female and the male the transplants had undergone nearly complete absorption. Of the remaining five, two died before the end of the first month. The remaining three, two females and one male, had active transplants, the male and one female having large 4 mm. transplants, showing clearly that growth had occurred.

At the beginning of the second month, the female with the large thymus transplants was bred, and at the end of the second month these transplants could not be found, though on account of the lactating breasts the examination was not satisfactory. The male with large transplants at the end of the first month had active transplants, possibly larger than at the first examination. The unbred female also had active transplants.

These preliminary experiments showed that in sexually immature rabbits, fragments of thymus autotransplanted into the subcutaneous tissue of the abdomen after thymectomy may survive and grow. There is clear though scant evidence in confirmation of the results of other observers that thymus removal hastens sexual maturity. The authors also think, as others have found, that utilization of rabbits for breeding hastens involution of the thymus. These experiments showed that this applies to the transplanted thymus as well, which suggests that a specific nerve influence is not essential for these involutionary changes.

GEORGE E. BELLBY

Woglom, W. H.: Loss of the Power to Produce Sarcomatous Transformation in the Stroma. *J. Cancer Research* 1917, 11, 471.

Woglom asserts that certain alterations which occasionally occur in the stroma of carcinomata are actually sarcomatous transformations. Like some other attributes such as keratinization, the power to induce sarcoma is not always a permanent possession of the carcinoma cell. This was first observed in the Flexner-Jobling tumor, an adenocarcinoma of the seminal vesicle of the rat, which cleared itself entirely of a sarcomatous portion between the fifth and eleventh generations, extending over a period of eight or nine years. Whether the power to produce sarcoma has been entirely lost cannot be determined as yet. Similar conditions have been found in tumors by other observers.

The author describes in detail a spontaneous tumor found in the left inguinal mamma of a mouse of unknown age. This neoplasm possessed and later lost the power of producing sarcoma. The original growth was removed and inoculated into young mice. The tumor developed in them was a carcinoma.

sarcoma, while the disc, removed from the spontaneous growth and examined microscopically in sections, showed no sarcoma; however, these sections represented only about a quarter of the whole tumor.

The neoplasm was an adenocarcinoma, more hemorrhagic than the ordinary tumor, and had extremely scanty stroma. With a few exceptions the daughter tumors preserved the adenocarcinomatous type in the main up to the present time. Alveolar areas and keratinization occur with relative frequency. It is probable that about one-quarter of all the spontaneous mammary carcinomata in the mouse produce more or less keratin, although there is not enough data at present to draw definite conclusions. Only about 12 per cent of sarcomata in man involve keratinizing neoplasms. But human mixed tumors may occur in practically any part of the body and cannot be compared to that of the mouse, where carcinomasarcomata occur exclusively in the mammary gland.

The question arises whether mouse tumors containing keratin may not perhaps induce sarcoma development in their stroma more often than other types of carcinoma.

L. R. GOLDSMITH.

RADIOLOGY

Kuegle, F. H.: The Uniform Standardization of Roentgenographic Technique. *Med. & Surg.*, 1917, I, 848.

The author believes that the lack of detail in roentgenograms is due to the fact that the image is not in focus. This viewpoint introduces a new idea into the science of roentgenography and challenges the generally accepted opinion that faulty definition is due to secondary irradiations.

Reasoning from the generalization that roentgen rays are subject to interference just as are ether waves of the visible spectrum, the focal spot in the Crookes tube is held to be analogous to the diaphragm in the camera obscura. It is then pointed out that whereas the minimum focal distance when using the pin-hole camera for photographing objects with reflected light is dependent upon diffraction, this does not obtain in roentgenography in which the image is produced by transmitted light.

The author states that a shadow may be considered sharply defined if its penumbra does not exceed a breadth of one-half millimeter. He then demonstrates that ether waves emanating from any given focal spot produce upon the photographic plate a shadow, a part of which is umbra, a part penumbra, and that the relative breadth and intensity of the umbra to the penumbra depend upon the following factors:

1. The size of the focal spot plus the evenness of the distribution of energy over its surface.
2. The focal distance.
3. The thickness of the part being roentgenographed.

Since these factors are subject to measurement,

a geometric equation for approximately computing the minimum focal distance becomes possible. This is formulated by the author as follows: The distance from the focal spot to the proximal surface of the body being roentgenographed, represented by X , is to the thickness of the part as the diameter of the focus spot is to one-half mm., the penumbral focal spot shadow consistent with good definition. The sum of X and the thickness of the part constitutes the minimum focal distance which will insure the production of an image having sharpness.

The present requirements for the making of better roentgenograms by the rank and file of roentgenologists are summed up tersely as follows:

The accurate standardization of roentgen ray tubes in accordance to the size of the focus spot so that the roentgenologist may know for what particular type of work a given tube is adapted.

The use of intensifying screens for medium and heavy work which require a tube having an extremely fine focal spot to produce an image in sharp focus, this being economically necessary to conserve the tube and prolong its life.

The elimination of so-called rapid or flash shot roentgenography except for cases where speed takes precedence over fine shades of detail, since only tubes having a very broad focus spot can be energized safely with high milliamperage at the voltages required for such work. Gastro-intestinal roentgenography is listed under this heading.

The author concludes that if these principles were borne in mind by all roentgenologists, the inevitable result would be the uniform standardization of roentgenographic technique.

Pirie, A. H.: Shrapnel Balls: Their X-Ray Characteristics Compared with Bullets and Other Foreign Bodies. *Canad. M. Ass. J.*, 1917, vii, 778.

Pirie's analysis is based on a study of 10,000 X-ray plates made during one year at a hospital in France. Shrapnel balls were shown on 241 plates and bullets on 242. Pieces of shell casing, bombs, hand grenades, etc., were shown on 3,346 plates. In no case did a shrapnel ball pass entirely through the body as a bullet frequently does; they were in several instances stopped by the skin on the opposite side from the entrance. There was no instance of the fracture of the femur shaft or the penetration of the brain by a shrapnel ball. In one instance both tables of the skull were fractured and the ball remained in the bone.

Shrapnel balls are usually of lead, but balls of iron have been found. Differentiation is important if the projectile is to be removed by aid of the vibrator. The shrapnel fragments generally have smooth or rounded edges. If a bone is hit, dust-like particles are seen at the contact.

Pirie believes that the shattering of bone by bullets occurs at the point of exit rather than at the entrance. In soft tissue the wound of exit is larger and more ragged than the wound of entrance.

DAVID R. BOWEN

Van Zwaluwenburg, J. G.: Greater Certainty in the Localization of Foreign Bodies in the Eye. *Am. J. Roentgenol.*, 1917, 10, 312.

After briefly reviewing the principles concerned in the localization of foreign bodies in the eye as revealed by the Sweet localizer, the author calls attention to various sources of error that may occur. These depend on (1) variations in the size and shape of the eye; (2) misrepresentations of the position of the marker with reference to the axis of the eye and to the surface of the cornea; and (3) changed positions in space held by the foreign body during the two exposures.

Relative to the first named, judgment should be left to the ophthalmologist who may have definite information derived from his clinical examination of the case to guide him in correcting this error. As regards the second, the author believes that fixing the patient's vision by directing the well eye upon a fixed point on the wall or ceiling, so chosen that the axis of the injured eye will have the proper direction, will correct the majority of those mistakes.

The third named is the commonest source of error. By a series of diagrams and mathematic computations the author shows how these errors can be minimized. This is brought about by the making of three routine exposures on the same plate, instead of the two usually employed. They should be made in this order: the tube in the caudad position for the first, cephalad for the second, and median for the third. This method, in addition to having all the advantages of the two-exposure method, enables the operator to prove the technical end of the work, to demonstrate the adequate fixation of the eye, or to obtain a fair approximation to the truth. It also provides definite solution in cases of multiple foreign bodies and in cases of unusual positions in and about the eye within the orbit. ADOLPH HARTUNG.

Houda, E. O.: Four Point Survey of the Localization of Foreign Bodies Without the Use of X-Ray Plates. *Northwest Med.*, 1917, XVI, 311.

The well-known method of fluoroscopic localization by triangulation is very practical, it depends solely upon the fluoroscope. Houda's method is generally described as the Thurston Holland method. It is the first step in the practical extraction of bullets used by Flint, who applies this diagram of the parts and the fluoroscopic markings upon a cross-sectional anatomy in order to determine his anatomical relations before operating.

The following brief extract from Houda's article describes the method: "These four survey points being located upon the skin, locate the common plane of two axial lines through an imaginary sphere. A cross section through this common plane would cut through the bullet at X. This common plane may be marked with silver nitrate to facilitate the extraction. Having fixed the four points and the common plane, the approximation of the depth at which the bullet lies is the final determination of this method."

"The two points which lie closest together determine the nearest approach to the bullet. The midway point between these two marks the basal point of the perpendicular of the lesser triangle. Considering the smaller base as one, the total of the ratios of the two bases gives the actual thickness of the limb. This must be so, since the ratios of the two perpendiculars are the same as the bases."

"If the upper base was one, the lower base three, the total of these makes the thickness of the limb four. The bullet lies at a depth of one-fourth of the thickness. Incision is carried down between the two points on the upper surface, which is a small base, in the common plane and a distance of one-fourth of the actual thickness of the limb. This method may be applied successfully to any part of the body." L. H. SKINNER.

McArthur, L. L.: Surgery of X-Ray Lesions. *Am. J. Roentgenol.*, 1917, 10, 531.

The author subdivides the roentgen lesions amenable to surgery into four groups: (1) keratoses; (2) acute burns; (3) chronic inveterate burns; (4) carcinoma developing in cicatrices or keratoses.

The first named, which according to Pusey are identical histologically with senile keratoses and like them meet with epitheliomatous degeneration, should be promptly removed and the skin defect covered by a Thiersch graft. This procedure has been almost uniformly successful.

In the case of acute burns, which occasionally persist and present a greyish-white diphtheroid ulcer with moist surface, if feasible the lesion should be excised and the skin edges undermined and drawn together. If impracticable, large well-fitting Thiersch grafts may be used with success. This is preferable if the skin surrounding the lesion is markedly impaired in vitality. The author's experience has demonstrated that such skin will not stand much tension on the sutures holding the edges together, but will cut through.

In chronic X-ray ulcers a similar procedure is followed. Carcinoma developing in cicatrices or keratoses is invariably of the squamous-celled type and is peculiarly prompt in involving the lymph glands. Its treatment, like that of ordinary carcinoma, consists in early removal of the lymph-nodes. ADOLPH HARTUNG.

MILITARY SURGERY

Plisson: A Mobile Surgical Unit (Un groupe chirurgical mobile). *Bull. Acad. de med., Par.*, 1917, sess. 362.

The object in view is to provide at the front a uniformly constituted surgical unit having all the surgical necessities for the immediate treatment of the wounded. This requires an autonomous, mobile, interchangeable formation.

The surgical group should be composed of complete and independent divisions in order that enlargement or curtailment of these may increase or

diminish the total capacity without altering the fundamental structure of the whole unit.

This surgical unit as designed has been put into effect at the front by the French service. Each unit consists of three distinct sections: an operative section, a hospital section, and an administrative section.

The operative section has five motor wagons, one for sterilization, one for surgical material, one for radiography, one fitted for operations, and one for pre-operative work. The light is furnished by the first wagon generated from the motor and distributed by connections.

The hospital section theoretically provides 100 beds. There are five divisions of 20 beds, each division being complete in itself.

The administrative section carries food and a kitchen, etc., for the personnel. The whole unit has its central station around which it is grouped. The sections are such that each may be independently increased or diminished according to necessity without altering the structure of the whole group.

This surgical unit fulfils the object of being autonomous and mobile. It is adaptable either to stationary warfare or moving troops and may be extended to meet the requirements of the work to be done. Quénu states that he has visited one of these formations, examined it in every detail, and was most favorably impressed. W. A. BRENNAN.

Roussy, G., and Lhermitte, I.: The Hemiplegic Form of Direct Shock of the Cervical Cord with Lesion of the Eleventh Cranial Pair (*La forme hémiplegique de la commotion directe de moelle cervicale avec lésion de la onzième paire crânienne*). *Ann de méd.*, Par., 1917, iv, 368.

In shell shock producing brain concussion the occurrence of an anatomic lesion is exceptional. This is not the case in spinal cord concussion. The concussion in this case is the jarring of the cord due to a traumatism either of the spine itself, of its bony appendages, or of the muscles which are inserted in it. This direct concussion differs much from contusion, attrition or wounds of the spinal cord. Besides such direct concussion there is an indirect concussion of the cord caused by shell shock, in which case the individual is not struck by any solid body. Such cases are, however, rare.

The authors report four cases which are very similar to each other and are of a new form and clinical type, i.e., spinal hemiplegia which does not show the Brown-Sequard syndrome, but which is associated with a direct lesion of the external branch of the spinal nerve. This lesion is the cause of an amyotrophic type of paralysis of the sternomastoid and trapezius muscles, with reaction of degeneration of the atrophied muscles which may be complete or incomplete. Sometimes fibers of the cervical plexus are involved in addition to the eleventh cranial nerve. The lesion is also the cause of sharp pains in the corresponding side of the neck as well as of anesthesia or hypesthesia in the painful area.

Hemiplegia appears after a few days when other symptoms due to concussion of the spinal cord have subsided. It does not remain complete very long; gradual recuperation is observed, at first of the lower, and later of the upper limb.

In one of the authors' cases there were subjective symptoms of sensory disturbance, pains in the paralyzed side of the body which were provoked by the slightest touch. These pains were quite different from the excruciating and tenacious pains observed in cases of concussion of the cervical portion of the spinal cord causing brachial diplegia. In this latter case the pains are localized in the area corresponding to the superior roots of the brachial plexus and are due to their involvement. In the former case the spinal cord alone is involved. In the first case there are objective signs of sensory disturbance; in the second there are none.

Other disturbances due to the concussion can be observed in these cases of spinal hemiplegia, such as vasomotor, sudoral, and thermal disturbance. Amyotrophy, involving the whole paralyzed side of the body, sometimes appears at an early date.

Hemiplegia as well as quadriplegia and monoplegia due to concussion has a favorable prognosis as regards life and often ends by a complete restoration of functional efficiency. This possibility is due to the fact that the lesions due to concussion chiefly involve the axial fibers. Thus in even apparently serious cases of concussion of the spinal cord there is the possibility of very satisfactory if not complete restoration. W. A. BRENNAN.

Goldthwait, J. E.: The Place of Orthopedic Surgery in War. *Am. J. Orthop. Surg.*, 1917, xv, 679.

The article deals with the conspicuous position which orthopedic surgery occupies in this war and states that much of the work that is now being developed is bound to be preserved to meet the civil needs when the war is over. In England, the work has been directed by Jones, who was formally appointed Inspector of Military Orthopedics in March, 1916.

Later an official classification was prepared of the conditions to be considered orthopedic. These are as follows:

1. Derangements and disabilities of joints, simple and grave, including ankylosis.
2. Deformities and disabilities of the feet such as hallux valgus, hallux rigidus, hammer toes, metatarsalgia, painful heels, flat and claw feet.
3. Malunited and ununited fractures.
4. Injuries to ligaments, muscles, and tendons.
5. Cases requiring tendon transplantation or other treatment for irreparable destruction of nerves.
6. Nerve injuries complicated by fractures or stiffness of the joint.
7. Cases requiring surgical appliances.

The magnitude of the problem is shown by the fact that from 30 to 50 per cent of all injuries require orthopedic treatment. When it is realized

that in the British Isles there are about 310,000 military hospital beds, apart from the 100,000 beds for British forces in France, the importance of the position can be appreciated. The responsibility has been still further increased by the fact that the problem of handling the limbless has been turned over to the orthopedic department.

At present there are 10,000 purely orthopedic beds under the direction of the Inspector, but at least ten times that number are required if the need is to be fully met.

Expansion of the service demands the securing of properly trained men for the staff. So much is expected from the orthopedic department that only men who are thoroughly trained can be considered, and they must be willing to serve reasonable periods of observation and instruction before they can be considered competent.

The hospitals are fully equipped with operating rooms, X-ray service, etc., and also have well-equipped departments for electrotherapy, hydrotherapy, massage and special exercise both passive and active. Equally valuable are the so-called curative work shops. The shops furnish a physiological and psychical stimulation to the patient. The occupation is selected and a special part chosen with reference to the particular need of the individual. For instance, in the case of a stiff wrist and poor circulation in the hand, work with a carpenter's plane will utilize the fingers as well as the wrist.

In regard to the limbless the duty of the orthopedic surgeon is to prepare the stump for the artificial member and to see that the adjustment is satisfactory. It is of the utmost importance that the joint above the amputation should have the normal range of motion, a fact which rarely exists as the patients are turned over to the artificial limb-makers.

The author presents figures showing the great value of expert orthopedic service in returning not only to useful civil life but to the army men who would otherwise be hopeless pensioners.

This work insures to the men not only the saving of life and the healing of wounds, but useful functioning in the damaged part. It is hoped that the necessary readjustment of American institutions will be made to meet this need in the civil accident.

The inadequacy of present hospital methods makes it quite obvious that after the war permanent, fully equipped orthopedic centers will be depended upon to save the many men who are being crippled by industry or disease.

The training which the orthopedic men of this country are receiving in the orthopedic centers of England will be of inestimable value in prepara-

tion for this future need, as well as for the more immediate need of caring for American wounded soldiers.

PHILIP LEWIS

HOSPITAL, MEDICOLEGAL, AND MEDICAL EDUCATION

Lyon, E. P.: Graduate Education in the Clinical Branches and the Minnesota Experiment. *J. Am. M. Ass.*, 1917, lxx, 1397.

The necessary technical processes of medical science have become too complex and numerous for one man to master. Division of labor or specialization is advantageous and unavoidable, and makes for better practice and for surer progress. Systematic graduate training in the clinical specialties, including advanced work in the underlying sciences, is a necessity.

The safeguarding of the public demands some method of certification for specialists. This is, perhaps, quite as important as the primary certification or licensure. How is the average citizen at the present time to proceed in order intelligently to select a competent surgeon?

The progress of medical science is of the utmost importance alike to the needs of the individual, to progressive civilization, and to the profession of medicine.

The leaders of medicine as exemplified by the class of specialists should be more than practitioners. They should be scientists. More rigid scientific preparation on the part of all physicians is needed, but particularly on the part of investigators.

These needs involve a task appropriate to a university. The practical question arises as to the extent to which a given university may undertake this work in medical specialization. The University of Minnesota is making an experiment in this connection. Their requirements are as follows:

1. For acceptance as a medical graduate student: (a) a bachelor's degree or its equivalent, which may have been obtained in a combined B.S. and M.D. course; (b) an M.D. degree from a good school; and (c) a year's internship in an approved hospital.
2. For the advanced doctor's degree: (a) at least three years of graduate study distributed chiefly between a major subject and one or two supporting or minor subjects; (b) a reading knowledge of German and French tested by special examination; (c) an acceptable thesis, which must contain the results of original investigation; and (d) final written and oral examinations before committees of the graduate faculty.

The graduate work is done in connection with the Mayo Clinic.

EDWARD L. CORNELL

GYNECOLOGY

UTERUS

Lindquist, L.: Results in Two Hundred and Twenty-One Cases of Laparotomy for Myoma (Redigermåte för en serie av 221 myom laparotomier). *Hygien*, Stockholm, 1917, lxxix, 625.

Lindquist gives a detailed tabular statement of 221 cases of uterine myoma in which he operated. These cases cover a period of eighteen years.

The operations performed were as follows: supravaginal amputation of uterus, 121 cases; total extirpation, 65 cases; enucleation, 16 cases; enucleation plus extirpation, 7 cases; extirpation, 12 cases.

One patient died after total extirpation and one after supravaginal amputation; both deaths were due to pulmonary embolism. This gave a post-operative death rate of 0.9 per cent. Disturbances followed in 45 per cent of the cases after artificially induced menopause. The rate was 41.6 per cent in cases where one ovary was left as against 51.6 per cent where both were removed. The final results were excellent in 94.2 per cent of the total extirpation cases and in 81.1 per cent of the vaginal amputations. Malignant degeneration was observed in 14 cases. Seven of these are still living, one of them for more than seven years since operation and 2 for more than three years. One died from other cause than recurrence after four years.

Despite the apparent statistical advantage of hysterectomy over the supravaginal amputation, the author prefers the latter, and continues to employ it whenever suitable. W. A. BRENNAN.

Novak, E.: The Organotherapy of Menstrual Disorders. *Bull. Univ. Md. Schl. Med.*, 1917, ii, 113.

After a review of the probable interrelationship between the internal secretory glands and the female generative apparatus, Novak enumerates the gland substances most commonly used and points out the types of menstrual disorders in which organotherapy is indicated.

These types, as the author has arranged them, are as follows:

1. Uterine bleeding without apparent cause, at or near the menopause.
 - a. Amenorrhœa in young girls, the so-called "functional amenorrhœa of puberty."
 - b. Amenorrhœa of later life, frequently caused by obesity and sexual hypoplasia.
2. Menorrhagia and metrorrhagia at puberty where there exists no definite pathological lesion.
3. Primary dysmenorrhœa.

The author prefers to look upon organotherapy as a species of drug treatment which is, therefore,

not usually specific, but effective as an adjuvant in the treatment of a given disease. Viewed from this angle, and considering the lack of any certain knowledge regarding their therapeutic indications, the results so far obtained by the administration of the organic extracts are certainly not discouraging. H. B. MATTHEWS.

Collins, C. U.: A New Operation for Prolapse of the Uterus. *Tr. South. Surg. Ass.*, St. Augustine, 1917, Dec.

This operation is presented for the relief of complete prolapse of the uterus in which the ligaments have lost their elasticity and the uterus remains permanently outside the vulva.

A Pfannenstiel incision is made, and a transverse strip of aponeurosis one-fourth of an inch wide is cut from the upper edge, leaving the two ends normally attached. A supravaginal hysterectomy is done and the strip of aponeurosis is laid in the cervical trough and the cervical edges or flaps are sutured over it.

The advantages over Kocher's operation or Murphy's modification are that no large pieces of uterine tissue are left in the abdominal wall, and its suspending power does not depend on adhesions between dissimilar structures such as uterine tissue to muscle and aponeurosis. The cervix is held by the strip of aponeurosis, normally attached at each end, which will not give or stretch, and by the union of dense cervical tissue over this strip.

Montgomery, E. E.: Choice of Operation for Retro-Displacement. *N. Y. St. J. Med.*, 1917, xvii, 437.

Retrodisplacements may exist for a long time without causing symptoms, but the author believes this is no argument against the correction of displacements, as the position interferes with the return circulation through the veins, and the uterus becomes larger from passive congestion. Its drainage is less effective and its resistance to possible infection lowered.

In a recently confined case mechanical means for holding up the subinvolved organ until involution is completed are justifiable. In a young growing girl, in whom mechanical means are not advisable, much may be done by deep breathing in the knee-chest position, regulation of the bowels and bladder, and avoidance of tight clothing. The erect position should be assumed while sitting, and the lateral and prone positions in bed. Swimming is an excellent exercise for those with a tendency to retrodisplacement.

The recognized inefficiency of the pessary as a curative agent has led to a search for more effective

measures. Montgomery reviews the various surgical procedures of shortening the round ligaments, ventrosuspension and fixation, shortening the uterosacral ligaments, and he states the objections to all of these. The most satisfactory procedure is a modification of the Gilman operation, which he performs as follows.

After opening the abdomen, breaking up adhesions and treating any abnormal condition of the tubes or ovaries, a ligature is carried under the round ligament one and one-half inches from the cornu. The ends of the first ligature introduced are secured by a haemostat, and the ends of the second threaded into the eye of a modified Deschamp needle.

The round ligament is caught with a haemostat external to the point at which the ligature passes beneath it. An incision is made in the anterior surface of the broad ligament, and the needle, threaded with both ends of the ligature, is carried outward between the layers of the broad ligament until it reaches the point at which the peritonium is reflected upon the anterior abdominal wall. Here it is brought through the aponeurosis and its ends secured with a haemostat which has been removed from the round ligament. The same course is pursued on the opposite side.

Then holding the ligature tense, a pair of closed scissors is passed along it through the aponeurosis, the blades slightly separated and withdrawn. Traction upon the ligaments usually brings through the loops without difficulty.

Each loop is then secured on either side by a suture, which includes the distal and proximal portions of the loop and a portion of the aponeurosis. The loop can be drawn out or relaxed so as to permit the necessary traction upon the uterus.

Montgomery has performed the operation alone or combined with other operations 806 times, with 6 deaths in the entire series.

This operation utilizes the best part of the ligament to hold the uterus forward, it creates and leaves no raw surface for subsequent adhesions, leaves the uterus movable but incapable of being displaced into the retro-uterine pouch. It leaves the ligaments capable of evolution and involution. It is applicable to difficult as well as simple cases, but will not cure all conditions.

When prolapse is associated with the displacement, the cervix should be drawn upward and backward, and in addition the operation should be associated with restoration of the pelvic floor and occasionally shortening of the uterosacral ligaments.

L. R. GOLDSMITH.

ADNEXAL AND PERIUTERINE CONDITIONS

Jack, H. P.: Conservative Surgery of the Fallopian Tubes. *N. Y. St. J. Med.*, 1917, xv, 443.

The author discusses the advisability of less radical treatment of infected tubes and declares there is a justifiable tendency toward conservatism in this field of surgery. He doubts whether patients

with infected tubes are given a fair opportunity for maternity, and suggests the possibility that a future co-ordination of gynecologists along conservative lines might result in the restoration of a larger number of women to a condition in which pregnancy might with reasonable possibility occur. He quotes from recent literature which states that the uterine end of the tube is seldom, if ever, closed. Nature shows a wonderful recuperative power in the tubes, pregnancy having been reported after ligation and resection and in one case, reported by Webster, the fimbria had re-formed at the end of the stump. Sterility is obtained with certainty only when the stump of the tube is peritonized.

Cases selected for conservative work should be under thirty-five years of age. The history of gonorrhoea or other infection should be clear and not less than from six to twelve months old, the gonorrhoeal pus being usually sterile by this time. The lesion should be located under anaesthesia, during which examination the stigmata of gonorrhoea should be sought and noted.

Red spots at the duct openings give presumptive evidence of Bartholinitis, and the lesion located in the tube indicates gonorrhoeal rather than puerperal infection, the lesion in the latter case being usually in the parametrium.

As to technique, the most gentle handling of tissues and the separation of adhesions under light is necessary. The author reviews the technique of Salatch, Childs, Stone, Turk and others, the essential part of which, in addition to the freeing of adhesions and the disinfection of the actual field by preliminary dilatation of the cervix, consists in swabbing out the uterus with 2 per cent tincture of iodine in alcohol and then forcibly injecting the same solution through the remnant of the tube down through the uterine cavity.

Jack's own contribution to the technique is the use of probe-pointed scissors in splitting the stump of the tube; these are especially useful where this step is particularly difficult on account of the extreme shortness of the stump. After splitting the tube, the mucosa is united to serosa and the everted split ends sewed to an ovary or the remains of one.

As yet, none of the ten cases which he has operated have borne children; the cases reported by the other men, however, are sufficiently encouraging to warrant continuing this conservative treatment, especially since serious postoperative results are not to be feared.

L. R. GOLDSMITH.

Butt, J. W.: A New Treatment of Acute Salpingitis. *J. Ark. M. Soc.*, 1917, xiv, 143.

Butt recommends the use of dehydrated magnesium sulphate in the vagina for the relief of acute salpingitis. Through a bivalve speculum one-half ounce of magnesium sulphate which has had the water of crystallization driven off by heating is put against the posterior wall of the vagina and held in position by a tampon of absorbent cotton. This procedure is repeated every twenty-four

hours for a period of time varying from six to twelve days. Rest, a light diet and a saline laxative are given.

The rationale of this procedure, according to the author, is explained by the fact that "magnesium sulphate acts as a dehydrating agent which relieves the pain by lessening the tension of the exudate both in the fallopian tubes and the pelvis." The author has used this form of treatment in 15 cases of acute salpingitis, and while he cannot assert that it cures salpingitis, he believes that it does relieve the acute attack.

H. B. MATTHEWS.

Miller, C. J.: Ligation or Excision of the Pelvic Veins in the Treatment of Puerperal Pyæmia.

Surg., Gynec. & Obst., 1917, XXV, 431.

Miller reviews the history of this method of treating puerperal pyæmia. In the other forms of puerperal infection, the tendency has been to abandon active surgical interference and to depend upon expectant treatment, this course being justified by experience.

In the pyæmic form, however, no method of treatment has reduced the mortality to any degree. The gaping veins at the placental site offer the most favorable opportunity for blood infection. If the invading organisms are highly virulent, a severe bacteræmia or peritonitis results before local processes may bar their advance; such cases are doomed from the beginning and death occurs with little if any local evidence of disease.

In cases with greater resistance or lesser bacterial virulence, protective thrombi may form in one or more of the pelvic veins. The infection may then become limited or the thrombi may extend and cause death by involvement of the larger venous trunks. More frequently the thrombus undergoes liquefaction and liberates septic emboli, which carry infection to remote areas and establish metastatic foci or abscesses.

Hunter in 1784 successfully treated a case of pyæmia by ligating the saphenous vein and Zaufel in 1864 was likewise successful in treating pyæmia of otitic origin by ligating the jugular. This principle was not applied in obstetrics, however, until 1902, when Bumm and Trendelenburg published their results in the treatment of puerperal pyæmia, the latter attacking the veins extraperitoneally, the former by the transperitoneal route.

In estimating the value of this treatment, four phases of the subject must be considered:

1. Can septic thrombophlebitis be recognized with sufficient accuracy to justify a serious operation?
2. Do the pathological conditions found at operation or autopsy justify intervention?
3. What are the indications for operation?
4. Has the mortality been reduced by operation?

In reply to the first question, while American obstetricians are skeptical as to the feasibility of diagnosis, those in Germany insist that it is possible in the majority of cases, differing however as to

how early a diagnosis can be made. Chills are the most important symptom but they are variable as to type and time of occurrence and may even be absent.

In some cases, 80 per cent, according to Leibnitz, the thrombosed veins can be palpated as worm-like masses high up in the outer portion of the broad ligament or along the spermatic veins. They are easily confused with pyosalpinx and parametritis, both of which present, as a rule, a more persistent temperature, with less tendency to recurrent rigors, and considerable pain.

Absence of pain is the rule in thrombosis, though it may be present in the beginning. The broad ligament is not fixed, as in cellulitis, nor does the mass approach the pelvic wall, as in simple exudates. Blood cultures are of little value.

In a case presenting high temperature, with marked remissions, without pelvic exudates or peritonitis, the uterus empty and correspondingly involuted, the diagnosis should not be difficult.

The frequency of the affection should be of some diagnostic value; a condition found in one-third to one-half of all women dying of puerperal infection should emphasize the probability of its presence in a given case.

With regard to the second question, pathological findings at operation or autopsy are a practically normal genital tract with the exception of thrombosed ovarian veins. A few cases show involvement of the lymphatics in addition.

While different veins may be involved, analysis of 100 cases shows: one spermatic, 75 times; both spermatic, 5 times; one hypogastric, 6 times; one hypogastric and one spermatic, 6 times; one common iliac, 8 times.

These findings are those obtained at operation, not at autopsy, when the thrombosis is usually much more extensive. This tendency of the process to primarily affect only one or two veins is a very strong argument for surgical treatment.

Some oppose intervention on the ground that the thrombosis is a protective process and that there is always a septic endometritis present, and that ligating or excising individual veins will not close all the avenues to the blood stream.

These arguments are answered in that a thrombosis is no longer conservative when it begins to liquefy and discharge septic emboli into the circulation; and furthermore, that the patient can usually withstand a septic endometritis if the veins do not become thrombosed and discharge infected emboli.

The principle underlying ligation of infected veins is the powerful resistance offered by the vessel wall to streptococci. It is a considerable obstacle to the highly virulent and an almost insuperable obstacle to the benign streptococci. Such a degree of resistance is possessed by no other tissue, and since a single vein is involved in most instances, it would seem a further proof that surgical intervention is a rational procedure.

Regarding the third question, the time to operate

is still a matter of discussion; some advise operation after the first chill; some not until the thrombosed veins can be palpated. The acute stage, during which general toxic symptoms predominate, lasts from eight to ten days, after which localization in the veins takes place and the constancy of symptoms becomes more decided.

Of the cases collected, the recovery statistics are better for those operated in the first and fifth weeks, though Venua had 51.8 per cent recoveries in those operated upon in the first two weeks and 42.8 per cent in the second two weeks. One reason for early operation is to prevent extension of the thrombus into the cava.

Operation is futile in cases showing evidence of peritonitis, broad ligament abscesses and multiple metastatic abscesses; acute endocarditis, pulmonary abscess or pneumonia usually indicate general pyemia and contra-indicate operation.

As to technique, in view of the location of the thrombus and incidental complications, the trans-peritoneal method is the only one to be considered. In pure thrombosis ligation is sufficient. Excision is indicated when there are peripheral processes or when the vein presents areas of softening which appear likely to perforate. Warnekros urges ligation of the common iliac in thrombosis of the deep veins and believes that in extensive thrombosis the cava can be tied without fear of gangrene.

As to the fourth question, the lowering of mortality by operation, it is generally settled that the average death rate is between 60 and 70 per cent. Of the operated cases, excluding those with cava thrombosis, the mortality was 51.6 per cent. Eliminating all the other hopeless cases, some of which were practically autopsies, as those with acute peritonitis, faulty ligation of the vessels, broad ligament and multiple metastatic abscesses, all of which are distinct contra-indications to operation, the mortality is reduced to 31.0 per cent.

The author appends the summaries of the 197 cases recorded in literature, this being the list published by Williams in 1900 and his own addition of the cases reported since. L. R. GOLDSMITH.

MISCELLANEOUS

Stevens, W. E.: Etiology and Treatment of Frequency of Urination in Women. *N. Y. M. J.*, 1917, cvl, 632.

Frequency of urination in women is often carelessly and unscientifically treated after a cursory examination is made to ascertain its etiology. The use of the endoscope, the cystoscope, ureteral catheters and the microscope are essential for accurate diagnosis, and should be preceded by a careful examination of adjacent abdominal and pelvic organs and accessory glands. Radiography and functional kidney tests are often required. For the latter, the intravenous phloridzin test has proved most helpful to the author, especially when the amount of urine is small and contains blood.

Pathological conditions of the urethra, bladder, ureters, kidneys, vagina, uterus, fallopian tubes, ovaries and rectum as well as general conditions such as diabetes, highly acid or alkaline urine, oxaluria, ptosis of the abdominal organs and central nerve lesions have been found responsible for this symptom. The most frequent cause is trigonitis associated with urethritis, pyelitis ranks next in order. A common factor, scant mention of which is found in the literature, is prolapse of the posterior urethral wall.

The treatment of trigonitis and urethritis which has proved of most value is the application of a two to ten per cent solution of nitrate of silver. Pyelitis is best treated by drainage through the ureteral catheter which may be left in position for a period of from two hours to several days. This, together with the production of a decided change in the reaction of the urine by means of acid sodium phosphate, sodium benzoate or potassium citrate, which inhibits the growth of the offending bacillus, usually results in recovery. Prolapse of the posterior urethral wall is best corrected by operative procedure.

In view of the numerous causes of this complaint, hasty conclusions should not be drawn as to its etiology, and treatment should be instituted only after a careful examination.

Watkins, T. J.: Radium in Hæmorrhage at the Menopause. *Surg. Clin. Chicago*, 1917, I, 1051.

In the first case reported by the author, the patient, aged fifty, suffered from persistent menorrhagia of the menopause after a vaginal fixation done seven years before. Under nitrous oxide the patient was curetted, but nothing abnormal was found. Fifty mg. of radium were inserted into the uterine cavity, the radium screened by one mm. of gold covered with rubber, and left in place for twenty-four hours. Slight bleeding followed for a week. Three months later the uterus was atrophied, the general condition was excellent. The radium had acted on the graafian follicles and produced definite changes in the endometrium and in the blood-vessels of the uterus.

In the second case, the patient, aged forty-seven, suffered from excessive menstruation. The uterus was large but showed no neoplasms. Twelve hundred mg. hours of radium were used. Six months after application the bleeding had been entirely stopped.

The radium element is in a small glass capsule; this is enclosed in a silver capsule and placed in a small gold capsule which is covered with rubber. To this a cord is attached to guard against losing the radium. It is introduced with the greatest aseptic precautions. A capsule of fifty mg. radium is left in place for twenty-four hours, i. e., twelve hundred mg. hours.

There is no pain from the use of radium. Slight nausea, vomiting, and a feeling of exhaustion are present for two or three days. Bleeding may persist for a few days following the use of radium, and

leucorrhœal discharges are often increased for two or three weeks. One menstrual period may occur after the use of radium.

This method will probably diminish considerably the hysterectomies done for menorrhagia occurring at the menopause and for persistent menorrhagia that not infrequently follows the operation of vaginal fixation.

S. W. BANDLER.

Delacroix, I. A. B.: Gangrene of the Extremities Consecutive to Gynecological Operation and Puerperium (Gangrene de las extremidades consecutiva a operaciones ginecológicas y al puerperio). *Thèse de doct.*, Buenos Aires, 1917.

Various aspects of gangrene following gynecological operations and the puerperium are discussed. Stein in 1916 collected 76 cases from literature, including 63 cases of peripheric gangrene consecutive to labor; 5 cases after abortion; 4 cases as complications of pregnancy.

The author considers the condition according as the obstacle to the circulation may cause (a) gangrene of arterial origin; or (b) gangrene of venous origin. The various theories put forward by different authors are reviewed and discussed.

Delacroix gives the details of a case following an operation. The patient was a woman of thirty-five years on whom a subtotal hysterectomy had been done for intraligamentous fibroma with double adnexitis. One month and a half later she left the hospital at her own request with a small fistula which persisted. She returned a month later in a very bad condition and unable to walk. The wound

was open and discharged a quantity of dark serous exudate. In the region of the left ankle there was a necrotic area about 20 by 10 cm. in size. The right extremity was similarly affected but to a lesser extent. Her condition rapidly became worse and the woman died after a few days. There was no autopsy.

The determining causes of the gangrene in this case, the author believes, are operation and infection acting in conjunction with a predisposing condition of organic debility. In the absence of autopsy it cannot be stated what type of gangrene occurred, but its development in corresponding areas suggest an arterial origin. Infection probably penetrated into the uterine artery sectioned during the operation, and by extension and formation of coagulation succeeded in occluding the primary iliac on one side; then continuing its extension, reached the aortal bifurcation and occluded the primary iliac of the opposite side.

W. A. BRENNAN.

Walters, F. A.: Gynecology in General Practice. *Clinique*, Chicago, 1917, xxxviii, 372.

The author states that exposure to the elements at or during the menstrual period often causes an engorgement of the pelvic organs or produces a relapse in patients undergoing treatment for such a condition. He believes that operative measures are resorted to oftener than necessary, and recommends the employment of the mixed infection serum and electric currents in salpingitis; and the use of iodine in connection with other remedies for a lengthy period of time in fibroid conditions.

L. K. P. FARRAR.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Cherry, T. H.: Description of a Simple Method of Performing Extraperitoneal Cesarean Section. *Am. J. Obst.*, N. Y., 1917, lxxvi, 590.

The author states that it is sometimes possible to do an extraperitoneal cesarean section when the classic section is contra-indicated, as in infected genital canals. Such a procedure is also preferable in patients with relatively contracted pelvis who have been in labor for a long time.

The two different methods of extraperitoneal cesarean section are (1) that by which the peritoneal cavity is not opened; and (2) the transperitoneal route, in which the edges of the incised parietal peritoneum are sutured to the visceral peritoneum of the uterus before the latter is opened.

The author outlines briefly the methods and modifications by Sellheim, Latzka, Gellhorn and Hirst. He then gives his method which is a modification of that used by Hirst. The usual abdominal incision is made down to the peritoneum. The muscles are then separated from the peritoneum along the entire length of the incision and for about 1½ inches to either side. The peritoneum is then opened vertically, the edges separated and sutured to the visceral peritoneum in such a manner that an oval area of the visceral peritoneum about 3½ by 5 inches is left exposed over the lower uterine segment. Interrupted sutures are used. Then the uterus is opened, the child extracted with forceps and the placenta delivered. One ccm. of pituitrin is then given intramuscularly, followed by 10 minims of ergotole.

The uterus is closed with interrupted chromic catgut sutures, the sutured edges of the parietal and visceral peritoneum are brought together, and the wound closed in the usual manner. W. L. BROWN.

Cumston, C. G.: The Indications for Cesarean Section Based on Twenty-Nine Personal Cases (Les indications de l'opération césarienne d'après 29 observations personnelles). *Rev. méd. de la Suisse Rom.*, 1917, XLV, 691.

The cases of cesarean section reported by Cumston occurred principally among American women. There was no death among the 29 women and only 1 death among 31 infants. Discussing the various factors calling for operation and the course to be pursued, Cumston believes that in cases where there is serious doubt of the possibility of labor either spontaneous or requiring slight intervention, it is better to resort to the cesarean operation unless the patient prefers to await the first labor pains, and knows the dangers to which she is exposed.

When doubt exists in the last month of pregnancy an attempt should be made under anæsthetic to engage the head in the superior canal. If this attempt succeeds and there is no other factor which would indicate cesarean operation, then the first labor pains should be awaited; but if it is not possible to engage the head in the superior canal and especially if the head remains above the symphysis pubis, cesarean operation should be done without hesitation.

In the case of a strictured pelvis, the transverse diameter of the lower passage should not be less than 8½ cm. and the posterior sagittal diameter should also measure not less than 8½ cm. to allow the passage of a normal child without undue difficulty.

Cumston considers the size of the fetus, primiparity, previous difficult labors, pelvic operations, and tumors, as factors indicating cesarean operation. Women having valvular heart disease can withstand a cesarean operation better than the fatigue of a labor especially if it is the first pregnancy and the soft parts are not yielding. In placenta prævia, if the uterine neck is long, rigid, and badly inclined, abdominal delivery is indicated. Regarding eclampsia as an indication, the author does not think cesarean delivery necessary if the pelvis is well formed and if there is no excessive vulvar oedema. Statistics of cesarean operations done in eclampsia show a mortality of 50 per cent, too high a percentage to counsel the procedure.

As a general rule it is better to suture the uterus after a cesarean operation and to return it to the abdomen than to make an hysterectomy.

W. A. BRENNAN.

Warner, F.: A Case of Cesarean Section in a Primipara Followed in the Next Pregnancy by Normal Delivery. *Am. J. Obst.*, N. Y., 1917, lxxvi, 598.

Infection following cesarean section may have two unfortunate results: (1) the death of the patient in many cases; and (2) a poor scar, since the infection involved the wound in the uterine wall and interfered with normal healing.

The dictum that a cesarean section once performed must always be followed by cesarean section still has its advocates, but many obstetricians now believe this does not hold if there was no infection of the wound in the first operation, and if it was not done because of a markedly contracted pelvis.

In cases where a high incision was made in the uterus with no infection, it is reasonable safe to allow such a woman to deliver herself spontaneously in subsequent labors. Giving pituitrin in such cases

adds greatly to the risk. Rupture of the uterus following the use of pituitrin has been reported in patients who had had no previous cesarean section; so one should be doubly cautious in using this drug on a uterus with a scar.

Cases have been reported of spontaneous delivery following previously infected cesarean sections, but to this group belong most of the ruptured uteri following cesarean section. Vaginal cesarean section may be elected if the patient is placed in a good hospital with constant care and observation.

Transverse, fundal, and extraperitoneal incisions are not as safe as the usual high midline incision. In Findley's report of collected cases, he deprecates the use of the bag, tamponing, high forceps, and pituitrin.

In general, the author believes that where healing has occurred without fever or pus formation in the incision, a scar is formed which will probably withstand a normal delivery, especially if the wound has been sutured with care. Both types of scars require constant observation in a well-equipped hospital during the last weeks of pregnancy and confinement.

The author reports a case of normal spontaneous labor following a previous cesarean section.

Cesarean section should be done in a primipara with a rigid and undilatable os, only where the vagina has not been contaminated by various examinations and manipulations. The author advises dilatation and podalic version in these cases.

If cesarean section must be done in such potentially infected cases, Newell believes it should be associated with hysterectomy at the time.

In his conclusions, the author states that cesarean section performed early in labor, before vaginal examinations and manipulations have been done, is as safe as any ordinary abdominal operation. In these latter cases craniotomy or podalic version are preferable to abdominal delivery. However, if a cesarean section is necessary, a hysterectomy should be done. If a normal delivery is attempted in a subsequent labor, it should be done in a well-equipped hospital, where the patient can be watched for signs of the scar yielding. The operating room should be ready for instant service. Only rectal and not vaginal examinations should be made.

W. L. BROWN.

LABOR AND ITS COMPLICATIONS

Danforth, W. C.: Nitrous Oxide Analgesia in Obstetrics. *Am. J. Obst., N. Y.*, 1917, lxxvi, 563.

An analgesic in labor has been sought for years. Chloroform, first used, has proved toxic for the parenchymatous organs of both mother and child when used over a long period. Ether was used, but like chloroform has the disadvantage of diminishing the force and frequency of the pains.

The author gives a brief sketch of the use of nitrous oxide, and reports work done along this line in the Evanston maternity hospital. A very important point in its use is to begin the nitrous

oxide inhalations early with each pain. To do this, the anesthetist is advised to keep one hand on the fundus of the uterus in order to ascertain the very beginning of a contraction.

Cyanosis is to be avoided; and if needed a little oxygen is added to the gas. Sometimes a few breaths of oxygen are given at the end of the contraction to strengthen the patient.

In cases where violent and frequent pains render laceration imminent, a little ether vapor is added to the mixture. This permits better control of the patient, does not nauseate, and does not prolong her complete recovery. Ether is always used for operative procedures and extensive perineal repairs.

After delivery and before tying off the cord, inhalation of a few breaths of oxygen will often restore a clear pink color in a cyanotic baby.

A total of 460 patients were given this type of analgesia for from five minutes to seven hours. Out of this number, only 7.5 per cent could be considered as having unsatisfactory results.

The condition of only 32 babies was reported as not good. This included those whose condition was reported as "fair."

Causes other than the anesthetic explained this condition in 12 cases. In 7 cases forceps delivery had been done and in 1 a breech extraction.

There were 6 stillbirths. Such conditions as hydrocephalus, premature labor, face presentations, craniotomy and breech presentations were assigned as causes.

Several cases of hæmorrhage in the newborn occurred. Ferguson thinks this hæmorrhage might be due to the nitrous oxide, and attributes it to a hæmolysis resulting from cyanosis, or partial asphyxia. However, the author states that there has always been a percentage of these cases similar to the present percentage, before the introduction of nitrous oxide.

A marked advantage gained by the use of this analgesic is the freedom from mental and physical exhaustion in patients delivered under the influence of gas. Nurses who attended cases where the gas had and had not been used, in some cases upon the same patient, noticed a marked freedom from signs of exhaustion and mental strain.

In his conclusions the author states that the gas should be given interruptedly for not more than three hours. It should be started immediately at the onset of each pain. Cyanosis is to be avoided. He lays stress upon the fact that experience is necessary in giving the nitrous oxide in order to obtain ideal results.

W. L. BROWN.

Davis, C. H.: A Study of Chloroform, Ether and Nitrous Oxide-Oxygen in Pregnancy and Labor. *Am. J. Obst., N. Y.*, 1917, lxxvi, 557.

Nitrous oxide-oxygen analgesia is being used much more extensively in labor now than formerly. The results vary materially, due to lack of experience on the part of the obstetrician. Some prefer chloroform or ether because these are less expensive.

The toxicity of the various anesthetics is considered and conclusions are drawn from experiments done on pregnant and non-pregnant guinea pigs.

Degenerative changes in the tissues follow long administration of chloroform, ether and nitrous oxide-oxygen to pregnant or non-pregnant guinea pigs. The changes in the liver are the most constant. If these degenerative changes do not result in death, gradual recovery may follow after a considerable time.

Chloroform causes central necrosis which is more permanent, while ether and nitrous oxide-oxygen produce changes coincident with cell asphyxiation. This dangerous element in the use of chloroform is not eliminated by using pure oxygen with it.

Long continued use of these anesthetics must be considered dangerous to the fetus *in utero*, though nitrous oxide-oxygen analgesia is less dangerous than anesthesia. However, there is no reason to believe that the long continued intermittent use of four or five inhalations with each contraction can be of any material danger to the fetus.

Chloroform does not cause death readily in obstetrical work, but it does produce central necrosis and fatty changes. These changes occur even though pure oxygen is given with the chloroform. These changes occur in the fetal liver tissue no doubt as a result of direct injury to the fetal liver by the chloroform absorbed through the placenta. Ether produces changes similar to those produced by nitrous oxide-oxygen but more permanent, perhaps because a much longer time is required to eliminate the ether from the tissues.

Nitrous oxide-oxygen administered to the pregnant guinea pig may cause death of the fetus without any apparent signs of asphyxia in the mother. This is probably due to inability of the tissues to use the oxygen in the blood in the presence of a high nitrous oxide concentration.

Danger from the use of nitrous oxide is primarily due to the long continued interference with the cell metabolism. This factor does not exist in the intermittent use of a few inhalations with each uterine contraction in labor, for the gas is quickly eliminated after each pain.

In conclusion, the author states that ether is the anesthetic of choice for long operative procedures in pregnancy or labor, while nitrous oxide-oxygen is preferable for short operations and examinations. As an analgesic early in labor, the author advises the use of an opiate alone or with chloral hydrate or scopolamine. During the painful second stage, nitrous oxide-oxygen is the most desirable, and chloroform is less desirable than ether. W. L. BROWN.

PUERPERIUM AND ITS COMPLICATIONS

Bland, P. B.: *The Treatment of Infection Following Labor, Mature and Premature.* Penn. M. J., 1917, xxi, 25.

Infection following labor forms one of the big economic topics of the present time, the author declares.

In 1914, 10,518 women died in this country from childbirth, and these figures represent the deaths in only two-thirds of the estimated population of the United States. From these figures one would be justified in believing that at least 15,000 women die in America every year as a result of labor. If the mortality that results from complicating conditions is added to these the author believes with De Lee that the total death rate would reach 20,000. If the mortality, therefore, of puerperal infection, as is generally conceded, is about 5 per cent, it would mean that in 1914 there were 100,000 infected puerpera in this country.

These figures have to do with labor at term. Exact figures concerning the number of abortions that occur are not obtainable. It is known, however, that about one abortion occurs for every four or five full term labors. The infection resulting in these cases arises either from interference or concealment and lack of care on the part of the patient during convalescence.

In considering the treatment Bland divides its application into: first, infection following labor at full term; (a) with the uterus empty and specific puerperal bacteremia; (b) with secundines retained; and secondly, infection following abortion.

In the first type the treatment is essentially conservative and along medical lines: rest, physical and mental; fresh air, day and night; feeding to the point of gastric toleration; elevation of the head of the bed; no purgation. Purgation, the author believes, does more harm than good. Elimination is favored by the free administration of water by the mouth and by the bowel. So-called specific therapeutic agents as serums, vaccines, and phagocytic stimulants in general have been discarded. As a rule, no drugs are given. Local interference of any kind is rarely indicated and its routine employment is mischievous. He emphasizes and condemns the futility of local measures which are still so frequently practiced. Curettage is a pernicious measure, and should never be used. Irrigations do no good and may be harmful, and even manipulation should not be resorted to unless there is some definite and positive indication.

In cases of material retained the author believes in waiting and trusting to the efforts of nature. If the retained material is not discharged within a reasonable time, it should be gently withdrawn either with placental forceps or with the finger. This procedure should never be followed by irrigation or curettage.

The treatment of infection following abortion is along the same general conservative lines, instituting general rather than local measures. Routine and habitual use of the curette should not be resorted to. Irrigations, too, are pernicious and do more harm than good.

The plan of treatment pursued by Bland is based on the modern knowledge of an individual's powers to vaccinate herself autogenously, to develop an active immunity. This has overcome the assump-

tion that puerperal infections are surgical emergencies, and should be treated by emergency methods. The author is convinced that ordinarily from an economic and conservative standpoint, both as concerns mortality and morbidity, better results will accrue from the application of conservative medical measures than from indiscriminate and hasty employment of surgery.

In discussing the treatment of localized collections in the pouch of Douglas or in the fallopian tubes as a result of puerperal infection, the author believes in a waiting policy. Medical measures should be tried first; if these fail, surgical treatment may be resorted to. Early or hasty surgery in limited puerperal exudate or puerperal tubal infection, in view of the present knowledge of immunology, is not indicated and its general practice means sacrificial and frequently unnecessary operation. The axiom usually applied to the operative treatment of pelvic inflammation to wait until the temperature reaches normal and then to operate is a wise teaching, but it does not fully cover the premises. At this period, nature's therapeutic agencies are just becoming operative. They should be given a chance. Wait until the temperature reaches normal and then continue to wait. In so doing a dangerous and mutilating operation may be avoided and anatomical structures may be preserved with physiological action.

The author believes that the whole aim of the surgeon in treating cases of puerperal infection should be directed, first, to conservation of life and health; second, to economy of tissue; and third, to preservation of function. He believes, furthermore, that these factors are better accomplished by relying on the power inherent in nature than by instituting indiscriminate and dangerous surgery.

MISCELLANEOUS

Smith, M. K.: Review of Recently Delivered Cases Observed During the Course of One Year in the Gynecological Class of the First Division of the Hospital. *Bull. Lying-In Hosp. N. Y.*, 1917, xi, 193.

During the year extending from November 22, 1915 to November 22, 1916, there were 289 cases in the gynecological clinic of the First Division of the Lying-In Hospital, representing about that

same number of individuals. These cases were divided as follows, according to months: First month, 81; second month, 92; third month, 18; fourth month, 39; fifth month, 20; sixth month, 19. In other words, as would be expected, it is the newest mothers who require the closest oversight.

The complaints also vary in incidence and character with the months. In the first month postpartum subinvolution is the commonest ailment, occurring in more than one-fifth of the cases. Unhealed perineal lacerations are a close second and nipple complaints a third. Rectal conditions, fissure and hemorrhoids, and retroversion follow, but are less frequent.

In the second month breast and nipple conditions occupy first place, abscess being the least frequent among these conditions. Subinvolution takes second place and lacteal conditions third, while unhealed perineal lacerations make a close fourth. Back strain comes next, while adnexal or parametrial disorders and retroversions are not infrequent.

The third month sees a marked drop in the number of cases. In this period retroversion stands ahead, while the other conditions mentioned as appearing in previous months appear with about equal frequency, with the exception of subinvolution which becomes less important.

In the fourth month, adnexal and parametrial conditions occupy first place while a new cause for seeking advice takes second place, namely, the question of a new pregnancy. By this time unhealed perineal lacerations and breast conditions are relatively infrequent.

In the fifth and sixth months, the pregnancy problem holds first place, with retroversion a close second. Other conditions, although still found in the list, are overshadowed by these two.

To summarize, the youngest mothers come back with subinvolution, breast and nipple inflammations, unhealed perineal lacerations, anal fissures and hemorrhoids, as the chief complaints, conditions depending more or less closely on labor and the early weeks of lactation. These give way in importance toward the end of the first half-year to a more permanent sequela of improper involution, retroversion, and to the question of another pregnancy.

C. D. HOLMES.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Hinman, F.: *Urological Diagnosis in General Practice*. *Calif. St. J. Med.*, 1917, xv, 392.

The necessity is emphasized of properly performed routine urological examinations on the part of the general practitioner, which will enable him not only to make an earlier diagnosis of cases but also to refer at an earlier date particular cases requiring a more complete urologic study.

The close anatomic and functional association of urinary and genital cases permits one general preliminary examination to cover all cases. On the indications of such a preliminary study, more detailed investigations would differ according to whether a lesion of the upper or lower tract were suspected.

In the study of kidney cases careful urinary, X-ray and renal functional studies are required as preliminary to the more special examination of cystoscopy, wax-tipped exploration, separate functional studies, pyelography, etc. Likewise cases with acute or chronic lesions of the lower genital tract are followed in a routine way.

The viewpoint of the urologist in analyzing urine should be more generally adopted by the general practitioner. Pus, blood, and the type of infection take precedence in his mind over specific gravity, albumin, sugar, and casts. The explanation of a few pus or blood cells as urethral or vaginal contamination is altogether too common; a simple method of collection will definitely determine the question. Catheterization or the use of the three-glass method, and the examination of a centrifugized smear with methylene blue stain carry considerable diagnostic value. Pus, blood, and bacteria in the bladder urine, no matter how small in amount, are pathological. A large percentage of pyuria cases are treated for cystitis without proper investigation. Usually cystitis is present in these cases but the cystitis is secondary and will clear up without treatment upon a cure of the primary focus.

Primary cystitis in the male sex is practically unknown and is extremely rare in the female. It is a grievous error, therefore, to institute any treatment for cystitis without first ascertaining the condition of the urinary tract below the bladder, and, if found negative, thorough investigation above the bladder should be made.

The causes of urinary frequency and difficulty in the male can usually be accurately recognized by the general practitioner, if he will make an intelligent rectal examination and will use a urethral catheter not only to measure residual urine but also the length of the posterior urethra. Practically every

man who presents symptoms and signs of prostatic hypertrophy and who has residual urine should be advised to have an operation.

The practitioner should be aware that the X-ray examination for calculus of the urinary tract is not infallible; 20 per cent of stones, in the ureter particularly, are missed. History reports of six cases are given in detail by way of illustration of urological conditions which are recognized late in their course and which, by the routine procedure as outlined, could have been recognized early and the grave prognosis in each case probably saved.

Hallé, N.: *Chronic Renal Tuberculosis* (*La tuberculose rénale chronique*). *Presse méd.*, 1917, p. 633.

Hallé thinks that surgical treatment is indicated in renal tuberculosis of open pyelitic form, whether primary or secondary. Operation should be early when observation shows that medical treatment is a failure. Indication for operation is debatable only in benign cases with slow progress. A spontaneous recovery may be expected if the patient is kept under careful surveillance and if prompt intervention is practiced in the event of aggravation.

Surgical treatment is contra-indicated in closed parenchymatous tuberculosis.

Total nephrectomy is the only efficacious and sure means of surgical treatment. Medical treatment is always a useful ally to the surgical treatment, both in preparation for the operation, and afterward.

The author discusses the polymorphism of renal tuberculosis. He thinks that tuberculosis with a tendency to spontaneous recovery corresponds to the type of closed parenchymatous tuberculosis in which the bacillary infection is hæmatogenous. Renal tuberculosis with no tendency to spontaneous cure is the clinical form corresponding to open pyelitic tuberculosis in which the infection is lymphogenous and often a mixed infection.

W. A. BRENNAN.

Martin, A. P.: *Hæmaturia in Kidney Calculus* (*La hematuria en los calculos renales*). *Sig'o méd.*, Madrid, 1917, lxi, 568.

Martin says that the characteristics of hæmaturia which are significant of calculi in the urinary apparatus are its appearance after exercise, and its slight intensity and short duration. As in other clinical experiences there are exceptional and anomalous cases. Martin gives the histories of three cases in which hæmaturia was the only clinical symptom of renal calculus which was found to exist.

W. A. BRENNAN.

Long, H. W.: Pyelitis in Children. *J. Mich. St. M. Soc.*, 1917, xvi, 438.

Pyelitis in infants is far more common than the average physician believes. Long contends that urinary infection occurs in one per cent of all cases of childhood. He also states that pyelitis is one of the most common of all the so-called obscure causes of fever in infancy and childhood. It occurs most commonly in female infants. The urine does not always show pus because occasionally the ureter becomes plugged with infective material. For this reason it is necessary to make repeated urine studies.

The most important symptoms are chill and high temperature. His treatment consists of large quantities of water and fluids generally, alkalies, malt soups and vegetables. Medicinally he administers potassium citrate in doses of 90 to 120 grains daily; hexamethylene in one-grain doses, salol, and cathartics to keep the bowels active. He believes vaccines may have some effect at times.

H. W. E. WALTHER.

Fullerton, A.: Gunshot Wounds of the Kidney and Ureter as Seen at the Base. *Brit. J. Surg.*, 1917, v, 248.

Fullerton reports his experience in the pathology and management of 42 cases of renal injury from gunshot wounds as seen at the base hospital.

The eventual pathology depends upon the structure involved in the injury, and for convenience injuries are divided into (a) those of the hilum, which may be the severance or trauma of an artery resulting in fatal hæmorrhage at once, or if a small artery, in anæmic infarction and eventual necrosis of the particular part of the kidney nourished by that artery; (b) wounds of the pelvis which are not frequent when uncomplicated; (c) wounds of the parenchyma which may completely destroy the organ or simply perforate it; (d) wounds of the ureter, usually present only with involvement of other structures.

The resultant pathology depends upon (1) direct damage; (2) damage due to interference with the blood supply; (3) damage due to pressure from hæmorrhage; (4) results of sepsis. Fullerton believes and presents evidence to support his belief that renal injuries so produced are purely local in character and that microscopic sections from parts distinct from the injury present no disorganization, as reported by others.

By studying the ureteral catheter urines as to specific gravity, presence of cellular structures, i.e., pus, blood, micro-organisms, and permeability to dyes, he finds that the cases may be divided into (1) those in which a rapid recovery takes place and where the function and urine of each kidney is normal after a week or more; (2) those which present a urine distinctly lower in specific gravity than its fellow, a functional test which he believes to be of much importance not only in injuries but in infections and calculi as well; (3) those presenting

disturbance of function as determined by indigo-carmin permeability. A definite increase in the time of appearance was noted on the affected side in some patients. Abnormal cellular constituents were found on the affected side in most instances.

To locate missiles the Mackenzie Davidson technique is used with much success. In many cases opaque ureteral catheters are passed into the renal pelvis and stereoscopic radiograms made with excellent results, determining thereby the exact location in many reported cases of the foreign substance within or without the kidney or ureter.

A special apparatus is described which is used to reconstruct the track produced by the missile. This apparatus in connection with cross sections of the body gives results as to the organs traversed by the bullet which postmortem and operation have shown to differ very little from actual conditions. It is of vast importance in cases of hæmaturia where surgical interference is indicated, cystoscopy failing, and no other method available to ascertain which kidney is in the path of the missile.

The associated injuries in order of frequency are those of the pleura, liver, spleen, spine, hollow viscera and pancreas; while the most prominent symptom is hæmaturia which may be profuse or microscopic, but must be differentiated in all instances of concomitant spinal injury from hæmorrhagic cystitis. Urinary fistula of course is diagnostic, while shock, anæmia, vomiting, abdominal distention, dullness in the flanks, and tumor may or may not be present, depending upon the extent of involvement and the complications. Sepsis is a common complication due to the presence of hæmatoma and necrotic tissue, which make excellent culture media, and the close proximity of the colon which may supply the original infectious material.

Secondary hæmorrhage is a relatively common and severe complication, occurring in 9 of 42 patients reaching the base whose kidney injury was either treated conservatively at the clearing station or was not known to be present. In several patients with secondary hæmorrhage there was no evidence or history of hæmaturia at the time of the injury, although there might have been a microscopic hæmaturia, easily overlooked. Nephrectomy was done on 8 of these 9 patients, with three deaths. The onset of the hæmorrhage occurs about 10 or 15 days after the injury. Fullerton states that secondary hæmorrhage is prone to occur in injured kidneys; as the blood supply is out of all proportion to the size of the organ, the blood-pressure is subject to sudden and frequent change; and collateral circulation being absent, the necrotic areas about the track of a missile tend to favor local sepsis which is always present in cases of secondary hæmorrhage.

Unfortunately there are no conservative methods of treating secondary hæmorrhage. The blood supply of the kidney is such that ligation is impractical, and complete nephrectomy must be done providing it is definitely known that the second kidney functions well. Many patients are nephrec-

tamized when partial resection might have been done, but Fullerton believes these cases are so few and the possibility of complete success so remote that he practices complete nephrectomy in all instances. When bleeding persists after the tenth day and is of sufficient quantity to produce anemia, or when a sudden profuse hemorrhage occurs, surgical intervention should take place at once.

Urinary fistula from injury of the pelvis, ureter or calyces through the parenchyma may immediately follow the injury or develop later, due to sloughing of the traumatized parts. These uncomplicated fistulae are not treated surgically at the base hospital, but later may require nephrectomy or plastic operations to close them. Fortunately many of the complications disappear spontaneously.

The chief causes of death in this series of cases were associated injuries, renal sepsis and secondary hemorrhage.

HARRY CULVER.

Iturbe, I., and Gonzalez, E.: Results Obtained with the Phenolsulphonephthalein Test in Functional Diagnosis of Kidney Diseases (Resultados obtenidos con la prueba de la fenolsulfonftaleína en el diagnóstico funcional de las enfermedades renales). *Gac. méd. de Caracas*, 1917, xxiv, 113.

The authors' study of Rountree and Geraghty's method of testing the kidney function is based on 80 cases in which it was possible to study the curve of elimination of phenolphthalein in the first and second hour after its injection.

The procedure employed systematically in all cases was as follows:

1. One hour before the injection 400 ccm. of water was administered to the patient and his bladder emptied, by the catheter if necessary.

2. An injection of 1 ccm. of phenolphthalein was made deep in the muscle masses of the lumbar region or intravenously, care being taken not to lose a single drop of the fluid since it might lead to an erroneous result.

3. Precisely one and two hours after injection the patient's urine was collected separately and the quantity of coloring material was determined by Autenrieth's colorimetric method.

In normal subjects the phenolphthalein appears in the urine in from six to ten minutes after a subcutaneous injection and is eliminated in 30 to 60 per cent within one hour; the elimination is 15 to 25 per cent in the second hour. If the injection is intravenous the substance appears in the urine in three to five minutes and there is an elimination of 65 to 80 per cent in the first hour.

A table of results shows that in subjects with functional integrity of the kidneys in which repeated examinations have failed to disclose any trace of albumin or casts, pulse and arterial pressure being normal, the elimination curve shows more than 70 per cent of the injection as a rule in two hours. Another tabular statement shows the relations existing between the phenolphthalein eliminations and the character of certain kidney lesions. This

table makes it evident that whenever a kidney lesion exists the phenolphthalein test gives precise indications of the state of the organ. In acute nephritis due to eruptive fevers, etc., the elimination increases as the symptoms improve.

From their own experience the authors believe that many of the contradictory results obtained by other investigators are not logically deducible from the data. Many such cases occur in women with severe genital affections or those advanced in pregnancy, and in spite of a functional integrity of the kidney the urinary secretion is disturbed.

In making the injection the bladder should be completely empty. Moreover, some have made the injection in the gluteal region, in which it is well known there is much fatty and connective tissue which makes the absorption of the injected fluid difficult. This disadvantage is overcome by injecting in the lumbar region, which is well vascularized and in which absorption is very rapid.

W. A. BRENNAN.

Kretschmer, H. L.: Ureteral Calculus; Removal by Intra-Ureteral Injections of Oil. *Surg. Clin. Chicago*, 1917, i, 1011.

The author discusses the diagnosis of ureteral calculi and calls attention to the fact that calcification of the ligaments, calcified lymph-nodes, plaques in the arteries and veins, phleboliths, and areas of calcification in the seminal vesicles or broad ligaments always give shadows that at first glance one would interpret as ureteral stones. He shows how nicely the differentiation between these shadows and those caused by true ureteral calculi can be made by using the shadowgraph ureteral catheter. No ureteral stone should be operated upon until a persistent effort has been made to relieve the patient by cystoscopic means.

He cites two cases of stone in the ureter, the first of which was relieved by a slitting of the ureteral sphincter with the cystoscopic scissors and simultaneous injection of oil into the ureter. Four subsequent injections of oil were made; two days after the last injection the patient passed the stone. The second case received three injections of oil. The author states that only four or five per cent of ureteral stones cannot be relieved by intravesical manipulations.

V. D. LESPENASSE.

BLADDER, URETHRA, AND PENIS

Bennett, A. K.: Vesical Calculus. *J. Mich. St. M. Soc.*, 1912, lvi, 440.

The recent experiences of Bennett in Mesopotamia form the basis for a report of 700 cases operated for stone in the bladder. The author discusses the etiology of this condition as found in the people who inhabit certain marshy localities along the banks of the Tigris and the Euphrates. Studies in parasitology recently carried out in the laboratory of tropical medicine in Liverpool tend to show that certain worms play a very important part in the

formation of vesical calculus, most particularly the bilharzia worm which is endemic in Egypt, the Soudan, and in the western parts of Arabia.

The worm is found in the portal and mesenteric veins but in these structures does not become markedly active. They commonly reach full development and sexual activity in the urinary bladder and rectum. Here the ova are deposited and multiply, and in each spot of accumulation in the walls of the bladder great proliferation of the mucosa is produced and a spongy tissue resembling papilloma or epithelioma is produced. These papillomata are exceedingly friable and hæmorrhagic, so that contraction of the muscle walls of either the bladder or the rectum may produce severe hæmorrhage. The worm gains entrance to the body by means of drinking water or through the skin. Men and boys are the greatest sufferers; only one per cent of females have been found affected.

As to treatment, Bennett states that in papilloma, perineal lithotomy with curettement of the bladder and removal of the spongy tissue is practised by the physicians of Egypt. For the removal of bladder calculi litholaxy is the operation of choice by the surgeons of India and Turkey. Bennett, however, states that most of his cases were relieved by suprapubic cystotomy. He leaves no drainage above but inserts an indwelling catheter into the urethra which is removed on the third day. H. W. E. WALTHER.

Selmi, M.: *Bladder Calculi in Infants* (Il piu piccolo ed piu grande dei calcoli vesicali da me curati nei bambini). *Polidlin.*, Roma, 1917, xxiv, sez. prat., 1078.

Selmi refers to two cases of vesical calculus in infants, the first and the last in a series of 23 cases operated upon by him. The calculus in his second case weighed 75 gr., the largest not only of his own cases but among all of those reported in literature. Selmi prefers cystotomy to lithotripsy in the treatment of vesical calculus, and thinks that in all cases very careful radiologic investigation as well as cystoscopy should be made so as to verify the conditions in the genito-urinary tract.

Referring to the surgical steps necessary to prevent recurrences, the author thinks that in cases of calculus complicated by cystitis it is necessary to establish and maintain for some time a large external aperture from the bladder; this is indispensable for the recovery of the cystitis and also prevents a rapid recurrence. The child operated upon for the large calculus, 7 years old, was a mere skeleton at the time of operation and is now in excellent health. W. A. BRENNAN.

Legueu, F.: *Bladder Wounds* (Sur les plaies de la vessie). *J. d'urolog. méd. et chir.*, Par., 1917, vii, 1.

Legueu has observed 43 bladder wounds since the beginning of the war. These rarely reached him in the first days of injury; the men were seen only after they had been passed along by several ambulances. Only cases in which the bladder wound was

the predominant lesion are considered. When the bladder wound is coincident with a severe abdominal wound, the latter indicates the gravity of the case and governs the treatment. Such wounds are excluded in this report.

The four factors which dominate the history of bladder wounds are: (1) the immediate and remote benignancy of a certain number of these wounds; some with perforation or even with the bladder entirely traversed have progressed without any grave complications; (2) the frequency of recto-sigmoidal communications; (3) the existence of a concomitant injury of the pelvic girdle; (4) the presence of foreign bodies in the bladder.

Six of the wounds observed ran a benignant course. Such are usually bullet wounds; shell wounds show important tears and easily produce a septic condition.

The neighborhood of the bladder and intestine explains the frequency of fistulae. In 15 of the cases there was a vesico-intestinal fistula. The site of perforation cannot always be easily found, and only in 2 cases was it found by rectal palpation. In these 15 cases there were 12 spontaneous recoveries without operation in a period varying from a few weeks to four months. The number of spontaneous recoveries shows the small need for early operation if a fistula develops.

Lesion of the pelvic girdle was observed in 29 cases or 50.9 per cent.

The immediate effect of such fractures is to create a path through which the urine easily reaches the exterior; and the consequences of this are infection, suppuration and general thermic reaction. When the fistula persists, the end-result very frequently is an osteopathic fistula of the bladder, with the formation of calculi. There were 10 cases which showed calculous formation of this kind.

In the 43 cases treated, a foreign body required removal in 12. This was in addition to those extracted before the cases reached the author.

Treatment should be immediate and include disinfection of the tract, removal of fragments of bone, etc., and extraction of foreign bodies. The vesical cavity should be thoroughly explored both by radiography and radioscopy; if these means are not available, every other known method of surgical exploration should be utilized.

Such treatment does not suffice to prevent infective complications, and it appears necessary as soon as possible, sometimes on the first day, to make a suprapubic cystostomy. The indwelling sound in such cases is only a make-shift to be employed when nothing else can be done. This operation was done by the author 11 times in the first days of injury; in 15 other cases it was done as a secondary operation. In all cases where an early operation was done, recovery followed; but even when done later, drainage was good and cicatrization was hastened. Experience has shown Legueu that a median cystostomy is the best measure for primary disinfection of the vesicocutaneous wound. W. A. BRENNAN.

Fowler, H. A.: Syphilis of the Bladder. *J. Am. M. Ass.*, 1917, LXX, 1329.

Syphilis of the bladder was considered rare formerly, and its existence even denied; in the last sixteen years, however, a number of authentic cases have been reported, the clinical data of which was sufficient for considerable thought and study. The history of cystic lues has three periods.

During the first period extending to 1879, cases of syphilitis which came to necropsy with findings of ulcers, tumors, or perforations of the bladder were considered specific in origin. Prokisch found 6 cases, and Morgagni and Ricord 2 cases.

In the second period, cases occurred in which the diagnosis was confirmed by the disappearance of all symptoms following antisyphilitic treatment.

The third period began in 1900 when Matzenauer first described the cystoscopic appearance of tertiary syphilis of the bladder. Since then 40 cases have been reported. In 1920 bladder involvement was found to occur in the secondary stage, as found by routine cystoscopic examinations. Luetic lesions occur also in the tertiary stage, and in parasymphilitic diseases, notably in tabes, the bladder is commonly involved. Age and sex are no barrier. Tabes and the associated bladder destruction is more frequently observed in males; it is more common in middle life.

Secondary lesions of the bladder appear within a few months after infection, and are generally accompanied by lesions of the skin and other organs. The tertiary lesions on the contrary appear after much longer periods, up to twenty-five years. The bladder lesion may be the only evidence of the disease. The majority of cases so far reported belong to the tertiary period. A mild case of cystitis occurring during the secondary stage of syphilis is suggestive and calls for a cystoscopic examination; otherwise the cystitis or a specific infection is easily overlooked, particularly as it disappears under salvarsan and mercury. Nine cases of secondary syphilis of the bladder have been reported, six males and three females. In all cases the bladder lesions were accompanied by secondary syphilis elsewhere, of the skin, mucous membrane, etc. Macules, papules and ulcerations have been described. In some cases the papules were disseminated over the bladder mucosa, resembling condylomata. The ulcers are usually multiple, rounded or oval, superficial with a slightly elevated edge and a necrotic base. The location is more frequently about the urethral orifices, but may be found in other parts of the bladder. The adjacent mucosa is indurated, the hyperemic vessels injected and prominent. The remainder of the bladder appears normal.

Symptoms vary with the location and character of the lesion, and at times are so slight that vesical lesions are found only during routine cystoscopy. With ulceration at or near the vesical neck, symptoms of cystitis more or less acute are observed.

Frequency, urgency and tenesmus may be marked, and are not influenced by rest. Pain is a constant symptom referred to the suprapubic area or perineum

radiating along the urethra to the rectum and to the lumbar region. Hematuria when present is not profuse and is always terminal. The bladder capacity is reduced. The urine is often clear, in the presence of infection it is turbid. Spirochetes have been reported in the urine but not confirmed. By far the greater number of bladder syphilis cases so far observed belong to the tertiary stage. Gummata of the bladder develop insidiously like all new-growths, and in the early stages produce little or no disturbance. Frequency may be observed; hematuria when it occurs is sudden and profuse and may be the first and only symptom. Pain is inconstant, varies with the location of the lesion and the presence or absence of infection as a complication.

As viewed by the cystoscope, two varieties of lesions occur, gummatus ulcerations and papillomatous growths. The former are more common. They occur separately or exist together. Papillomatous lesions are rare, usually multiple, and resemble cancer; operation should not be advised until the therapeutic test has failed. The secondary lesions are superficial. The tertiary involve the deeper layers of the bladder wall and unless arrested may result in perforation with peritonitis and perforation of the bowel. Syphilis is one of the etiological factors in the production of vesico-intestinal fistulae. Vesicorectal or vesicovaginal fistulae may result from perforation of the bladder base.

Bladder syphilis is prompt to respond to specific treatment, as is characterized by subsidence of all symptoms and the gradual disappearance of vesical symptoms. The treatments usually employed for ordinary cystitis have no influence whatever on either the symptoms or the lesions.

C. R. O'CROWLEY.

Thompson, J. E.: A Study of Modern Operations in Hypospadias from an Anatomical and Functional Standpoint. *Surg., Gynec. & Obs.*, 1917, XXV, 411.

The author classifies the varieties of hypospadias into: (1) balanic, (2) penile, and (3) perineal. The adult urethra develops in three distinct parts. The posterior part corresponding to the adult prostatic and membranous urethra is developed from the embryonic urogenital sinus; the penile portion is developed from a longitudinal groove which appears on the genital eminence; the glandular portion results from the tunneling of a special epithelial mass which appears on the under surface of the glans.

Operation is not justified in the perineal type with undescended testicles which are probably sterile and impotent. It is not necessary in many cases of the balanic type with a straight penis. In all others operation is imperative. The suitable date for operation is between the sixth and ninth years. After puberty there is serious danger of an erection during convalescence which would tear the flaps apart.

With regard to operative procedures, in the ante-

rior varieties preference is given to penile and preputial flaps as in the Mayo and Duplay operations. A modification of the Russell operation is described. In the posterior varieties the Russell method is by far the most satisfactory. Bladder drainage is considered essential to success in the one-stage operation and in the final stage of the two-stage operation. Drainage above the pubes is preferred.

GENITAL ORGANS

Robbins, F. W., and Seabury, F. P.: The Treatment of Chancroid. *J. Am. M. Ass.*, 1917, lxi, 1212.

The authors recognize the following clinical varieties of chancroid: (1) *ulcus molle*, the common type with clean-cut, undermined edges; (2) *ulcus molle miliare*, occurring most frequently on exposed surfaces in the loose skin, a papule rapidly becoming a pustule; (3) *ulcus molle elevatus*, slightly raised above a mildly infiltrated base with slight tendency to spread and resistant to treatment; (4) *ulcus molle phagedenicus*, the most severe form, spreading rapidly and capable of great destruction.

About 60 per cent of all soft sores if kept rigidly clean get well in from four to eight weeks with no treatment other than calomel dusting powder. Thorough cauterization with nitric acid within the first two or three days will sterilize the sore so that healing will take place. The authors advocate the use of a 25 per cent solution of copper sulphate and the short high frequency spark from a rather fine-pointed vacuum electrode applied directly to the sore for from one to three minutes. The point of the electrode is carried well down into any fissure or undermined edge and about one-sixteenth of an inch into the doubtfully healthy area. Any exposed sore is then covered with a thick, moist, mildly antiseptic dressing changed frequently. If completely sterilized on the second day the wound will present a perfectly healthy granulating surface which begins to heal in a few days. If not, the same procedure is repeated every second day.

This method of treatment has enabled the authors to report practically 100 per cent of early cures in a series of about sixty cases. H. W. PLAGEMEYER.

Ramos, C.: Rupture of the Tunica Vaginalis in Hydrocele (Des ruptures de l'hydrocèle vaginale). *J. d'urolog. méd. et chir.*, Par., 1917, vii, 45.

Rupture of the tunica vaginalis in hydrocele is very rare. The first case in literature is reported by Bertrandi in 1757, and it has become less frequent since the introduction of improved surgical technique in the treatment of hydrocele.

Spontaneous rupture is rare and most cases are due to a traumatism by muscular effort. The author has observed two cases in Legueu's clinic, one traumatic and the other spontaneous. The traumatic case occurred in a man of 65 years with a left-sided hydrocele. Operation by Legueu disclosed a vertical tear of the serosa about 3 cm. long on the antero-internal wall of the vaginal sac.

The spontaneous rupture occurred in a man of 49 with a left-sided hydrocele. About 6 months before coming to the clinic the man observed that the tumor had altered its habitual shape and had become soft, flaccid, and considerably larger. There was no pain nor feeling of rupture. Operation disclosed a vertical slit in the serosa about 2 cm. long and situated in the middle part of the anterior face. Both cases recovered.

The author reviews from the literature 7 traumatic cases, 6 due to muscular effort, and 2 spontaneous cases. A consideration of the cases shows that there is no site of election for vaginal ruptures. Experimental research work done at autopsies confirms this view. Pre-existing lesions and the more or less sudden distension of the sac by a rapid increase of effused fluid are predominant factors in the mechanism of spontaneous rupture.

Clinically the constant and most striking symptoms are immediate change in the form of the tumor and scrotal oedema. In many cases after absorption of the effusion and obliteration of the orifice of perforation, the tumor is reproduced very rapidly.

W. A. BRENNAN.

Cecil, A. B.: Surgical Treatment of Seminal Vesiculitis. *Calif. St. J. Med.*, 1917, xv, 497.

The author describes the anatomy, pathology and symptomatology of seminal vesiculitis, and reports two cases and the surgical procedures followed.

While gonorrhoea plays an undoubtedly large part in the original infection, Cecil claims the gonococcus is supplanted by other bacteria, and it is his purpose to make cultures at the time of operation, as the study of the vesicles after death is inconclusive because of the known frequency of postmortem infection. The author also claims that in cases presenting symptoms of chronic cystitis, it is not alone sufficient to rule out the question of infection of the kidneys and the cases of mechanical obstruction and intravesical causes, but it is also necessary to thoroughly investigate the seminal vesicles. He reports two cases to support this contention.

The condition has been attacked surgically by four different methods: namely, vasopuncture, with spermatocystic medication, vasotomy with drainage of the vesicles through the vas, vesiculotomy and vesiculectomy. Vasopuncture has proved to be of considerable value but it has its limitations, as in occlusion of the vas, cases in which infection is walled off in a part of the seminal vesicle or is located in a walled-off diverticulum of either the ampulla of the vas or the seminal vesicle. The same objections are offered to vasotomy. Cecil states that in cases of seminal vesiculitis which seem to persist in spite of massage, it is of great diagnostic value, for it is evident that if the ejaculatory duct is occluded on one side or both, massage of the seminal vesicles must be worse than useless. He believes that seminal vesiculectomy is the operation of choice.

In his operation he follows Young's technique, using his tractor which avoids tearing the prostate

and enables him to palpate on the instrument in the bladder and to rotate first one vesicle into view and then the other. He lays especial stress upon having an exaggerated lithotomy position. He avoids using a rectal plug, as it causes discomfort and is liable to cause a rectal fistula. Louis Gauss.

Judd, E. S., and Braasch, W. F.: The Advisability of Prostatectomy in the Presence of Cord Lesions. *Illinois M. J.*, 1917, xxxii, 729.

Judd and Braasch discuss the advisability of the removal of the prostate in cases presenting signs of lesion of the spinal cord. Nine such cases have been operated upon at the Mayo Clinic. One of these died eighteen months after the operation. Seven report that they are in good condition and have no urinary trouble. One, operated upon six months previously, still complains of frequency of urine and of a slight degree of incontinence.

The authors believe that the question of operation should be decided according to whether the difficulty of urination is due to mechanical obstruction or not. This fact can be determined through cystoscopic examination and by observing the expulsive power of the bladder muscle. If the clinical evidence of advanced cord lesion is well marked,

operation is contra-indicated, but in early cases or in those in which the tabes involves some portion of the cord other than that which controls the urinary mechanism, the question of prostatectomy should be carefully considered. G. G. SMITH

MISCELLANEOUS

Elsenstaedt, J. S.: Mechanical Aids in the Diagnosis of Lesions of the Upper Urinary Tract. *Surg. Clin. Chicago*, 1917, i, 799.

The author discusses in detail the various methods of exact diagnosis used in genito-urinary diseases and contrasts this with the clinical findings. He summarizes as follows:

1. There are various methods for examination in the diagnosis of lesions of the urinary tract.
2. These overlap and supplement each other.
3. These include cystoscopic examination, ureteral catheterization, X-ray, and chromocystoscopy.
4. The clinical and laboratory findings should not be neglected.
5. The necessity for the use of these procedures lies in the fact that many serious lesions may pass under the mask of various other diseases.

A. C. STOKES.

SURGERY OF THE EYE AND EAR

EYE

Magitot: Wounds of the Eye in War (*Les plaies de l'œil en pratique de guerre*). *Rev. gén. de clin. et de thérap.*, 1917, xxxi, 657.

There are three types of eye injuries in war: lacerations, wounds of the posterior part of the ocular globe, and wounds of the anterior part.

Lacerations usually accompany complicated orbital fractures or maxillary-facial fractures. The treatment is disinfection of the region, with lavage of the globe with hypertonic salt solution, and enucleation. The conjunctiva must be respected as much as possible, so as to obtain after cicatrization a cavity well adapted for an artificial eye.

Injuries of the posterior part of the globe can occur without wounding of the lids and may be: (1) a wound of the external angle of the eye; (2) a wound of the temporal orbital wall; (3) an intra-ocular hæmorrhage affecting only the posterior segment, caused by a projectile passing through the neighboring tissues.

The following signs suggest penetration: (1) considerable chemosis; (2) orbitopalpebral hæmatoma; (3) protrusion of the globe; (4) frequent but not constant presence of blood in the anterior chamber; (5) soft ocular globe; (6) loss of vision; (7) immobile, deformed, dilated pupil; (8) insensitive cornea.

The author in general recommends temporizing; expectant treatment with disinfection will suffice if there are other important lesions to be attended to.

Wounds of the anterior segment are of two kinds; either the eye, partly empty, shows extreme hypertonia, or else there is a wound, with preservation of the normal form and consistency. This latter type is often considered to be a traumatic conjunctivitis, when in reality there is a penetrating wound. The patient should be carefully examined for signs of penetration. When there is penetration with the foreign body retained, an immediate toilet of the globe should be made. The eye is then submitted to the action of a large electromagnet which will extract any magnetic body. If the foreign body is not magnetic, a radiographic examination is made to find if the body is intra- or extra-ocular. Certain metallic foreign bodies are well tolerated by the eye, but others, such as copper, are badly tolerated.

In wounds of the anterior segment with hernia of the iris or of the ciliary body, it is necessary to excise these fragments. Enucleation should be the exception. An effort should be made to cover the conjunctival wound with the mobilized conjunctiva.

The author describes his method. In the case of infection it may be necessary to enucleate.

Regarding sympathetic ophthalmia the author says that he has not observed a single case during the war.

W. A. BRENNAN.

Kearney, J. A.: The Appearance of the Fundus Oculi in Certain Intracranial Conditions. *Med. Rec.*, 1917, xcii, 730.

Thirty-five cases of brain tumor were observed and thirty-two cases operated upon. From the standpoint of vision, a decompression is advised before the œdema becomes densely opaque because when this appears, gross destructive changes have taken place in the nerve and the time is passed when good vision may be assured. By an ophthalmoscopic examination of the fundus of the eye, many of the brain tumor cases are diagnosed as such for the first time only when sent to a hospital. It is of great importance, therefore, that every patient who complains of uncontrollable persistent headaches should have a careful ophthalmoscopic examination.

Intracranial hæmorrhage at birth is responsible for 70 per cent of the spastic type of paralysis in children and 20 per cent of the resulting idiocy and feeble-mindedness now existing. One of the earliest indications of the existence of increased intracranial tension is determined by an ophthalmoscopic examination of the fundus of the eye. There is usually seen in the fundi of infants' eyes shortly after birth, when an intracranial hæmorrhage is present, a general œdema blurring all retinal and disc details, or a mild œdematous blurring of the nasal half of the disc, or rarely a measurable œdema occupying the entire surface of the disc. This observation is important because it indicates an increase in the pressure of the cerebrospinal fluid and lumbar puncture findings usually verify it.

Almost 1,400 children having spastic paralysis with or without mental impairment, of ages varying from 1 day to 20 years, have been examined with the ophthalmoscope to ascertain the presence or absence of an increased intracranial pressure due to hæmorrhage, and of this number 300 children have shown the distinct œdematous changes above described; that is, about one child in every five examined.

In cases of recent fracture of the skull, and especially basal fractures, an increase in the intracranial tension is usually the most damaging factor.

Frequent and careful observations are made while these patients are in bed. In cases uncomplicated by an increase in the intracranial tension, the retinal œdema gradually subsides. Occasionally, in some of the routine examinations, after the first twenty-four

hours following the accident, an increase is noted in the general edema that previously existed, or to the edema that heretofore blurred equally all details there is a decided added obscuration of the nasal half of the disc and its margins. These observations are valuable because they indicate quite early a rise in the intracranial pressure, and the spinal mercurial manometer will confirm it at lumbar puncture.

It is advisable that all cases of fracture of the skull be placed at complete rest in bed, with an ice helmet to the head, and free catharsis maintained. If no signs or symptoms referable to an increase in the pressure of the cerebrospinal fluid develop, the above treatment is all that is necessary; but if the intracranial tension is increased up to nearly double the normal, then in selected cases repeated lumbar punctures are done, depending upon the nature of the symptoms. If, however, the tension of the cerebrospinal fluid is found to be double the normal or even more at lumbar puncture, whether or not the pulse rate is lowered, then it is advisable to do a simple decompression operation before a possible collapse of the medulla occurs. EDWARD L. CORNELL.

Aymard, J. L.: A Cartilage Prosthesis for the Eye.
Lancet, Lond., 1917, cxcvii, 644.

The failure of the artificial eye from a cosmetic point of view depends upon immobility and depression. The former condition is due to the absence of a mass of tissue fitting inside the artificial glass casing, and the latter to the fact that a sphere has been replaced by a shell.

The author is now employing spheres constructed from costal cartilage as natural tissue prosthesis for the eye. Two hemispheres of cartilage are trephined from the eighth costal cartilage and are fixed together with cartilage or with catgut to form a sphere.

In primary enucleation the surgeon places the cartilage sphere inside Tenon's capsule and sutures the same, then sutures the conjunctiva. Whether cartilage spheres can be introduced into a septic eye socket remains to be seen. The author thinks it worthy of trial. V. C. HUNT.

EAR

Martino, P. J.: Latent Otitis of Early Infancy (*Otitis latentes de la première enfance*). *Arch. de méd. d. enf., Par., 1917, xx, 476.*

The frequency and gravity of otitis in infants renders its study interesting to the pediatrician.

Autopsies of infants show how often otitis passes unnoticed during life. Bartillon in 27 autopsies of infants dying during the first month of life found suppuration of both ears in 25. Ponfick found suppuration of the ear in 91 per cent of infants treated for bronchopneumonia or gastro-enteritis; Gompers found 90 per cent of suppurative otitis in infants dying with different affections.

In a great many cases the otitis of infancy remains latent for a considerable time without either localized pain or otoscopic signs. Many morbid conditions considered as primary infections of the digestive tract, pulmonary passages, etc., if they are not secondary to oto-naso-pharyngeal infection, are at least concomitant and due to a common cause. This cause has generally a purely anatomic basis, due to some defect of development.

Diagnosis of otitic infections, excluding cases of spontaneous perforation or of rapid localization of otoscopic signs, is ordinarily difficult, and the delay may give rise to complications which result fatally.

It may be admitted that in all general diseases of infancy the existence of an otitis media is the rule. When a febrile septicemic condition persists, without other apparently attributable cause, the ear is probably the cause. Even when there are no clear local symptoms it is well to practice a paracentesis, which if done early and carefully brings about recovery in all positive cases and does not entail anatomic or functional complications in negative cases. W. A. BRENNAN.

Shambaugh, G. E.: Suppurative Otitis Media with Paralysis of the External Rectus. *Surg. Clin. Chicago, 1917, i, 841.*

The patient was a man 68 years old who had had a profuse purulent discharge from the right ear for eight months. A radical mastoid operation was performed, and because of persistence of discharge the wound was opened and tubal cells curetted, during which the internal carotid artery was punctured. Firm packing controlled hemorrhage.

A few days later there occurred paralysis of the right external rectus muscle which persisted for eight months. The persistent discharge which continued for months after the last curettage, as well as the affection of the sixth nerve, was probably due to involvement of the apex of the petrous portion of the pyramid. OTTO M. ROTT.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Guthrie, D.: A Clinical Lecture on Some Nose and Throat Diseases of Childhood. *Brit. M. J.*, 1917, ii, 355.

The author discusses briefly many common affections of the nose and throat, such as adenoids and hypertrophied tonsils, the tonsil operation, foreign bodies in the nose and air passages. It is not necessary to examine for adenoids with the finger, in the presence of very large tonsils. In such cases the presence of adenoids may be assumed.

Guthrie believes that the tonsils should be removed from all patients in whom the cervical glands at the angle of the jaw show enlargements. He mentions rheumatism as another indication. Many systemic conditions are due to the absorption of infection or toxins, and the tonsils of every patient suffering from some systemic condition ought to be carefully examined.

JAMES J. KING.

Skillern, R. H.: Diagnosis and Treatment of Sinusitis in Infants. *J. Am. M. Ass.*, 1917, lxi, 895.

The author is of the opinion that so-called sinusitis in infants is misnamed and bears out the assertion by a consideration of the anatomical development of sinuses. He takes the age of five as the dividing line between infancy and childhood in sinus development. Of the accessory sinuses, the ethmoid is the only one which is well developed; the maxillary is small and rudimentary. Under two years the sphenoid is but an indentation; the frontal has not yet made its appearance. After the sixth year the true sinuses have become developed.

Localized sinusitis in infants has not come under the author's observation, nor has he found a case report in literature. Any disease which affects these sinuses in infants under two years does not limit itself to the maxillary sinus or ethmoid cells but affects the surrounding tissue as well.

The symptoms are of unusual severity, affecting the mucosa and the soft spongy underlying bone, destroying the side of the face involved, and often rupturing externally either above or below the orbit. In recent cases there is a profuse nasal discharge. The ethmoid cells are separated by layers of soft young bone which are as susceptible to disease as its own lining membrane.

The affection spreads to the canaliculi and appears externally on the face. If seen early, a thorough endonasal curetting of the ethmoid cells and antrum will prevent an external fistula.

Sinusitis in children over five years of age ap-

pears as a "common cold in the head," the discharge continuing until a sinusitis is present. It does not run so severe a course as in infants and has a greater tendency towards chronicity.

The author urges careful and thorough examination of these cases. Differentiation must be made from adenoids with postnasal suppuration; one sweep of the curette is sufficient. The source of the discharge can be established by means of the nasopharyngoscope. The author does not recommend the puncture needle. Transillumination is worthless. The roentgen ray is of positive assistance, since it gives an idea of the size, shape and condition of sinuses. In the beginning of an attack the condition can be brought under control by general and intranasal treatment.

Vaccines are found more useful than in any other sinus disease. If an operation is indicated, it should be done at once. The disease progresses so rapidly that unless immediate operative procedures are instituted extensive radical measures will be required to save the child's life. There is a previous stage during which proper treatment would have prevented exophthalmos, swollen lids, and hideous deformity from an abscess about to rupture.

Removal of the anterior and middle turbinate followed by antiphlogistic measures are recommended. The author first performs intranasal exenteration of the diseased ethmoid cells and maxillary antrum, with subsequent application of an organic silver salt. If there is considerable redness and swelling, a puncture large enough for a drain can be made on the face.

The author does not favor the Caldwell-Luc or any similar procedure through the canine fossa for maxillary sinuses. If the antrum alone is affected, any thorough intranasal operation will give a good result.

M. A. BERNSTEIN.

Ingals, E. F.: The Intranasal Drainage of the Frontal Sinus. *Tr. Am. Laryngol. Ass.*, Atlantic City, 1917, May.

Ingals believes that in a large majority of cases of chronic frontal sinus disease, free drainage is all that is necessary, and that vigorous curettagé is a bad practice, although gentle removal with a curette of polypi or granulation tissue, if present, would undoubtedly hasten the cure.

The furore for extensive mutilating operation on the frontal sinus has had its day, and now more conservative intranasal drainage is a practice that is generally accepted.

The author's attention was first called to the benefit obtained from intranasal treatment in 1893.

when he succeeded in curing two cases by intranasal treatment, as neither of them would consent to an external operation. As drainage into the nose was a prerequisite for treatment, he devised a burr with a safety guide to be run into the nasofrontal duct so that the duct could be enlarged permanently.

This burr made a canal 6 mm. in diameter, which, however, had a tendency to contract. To prevent the latter, a metal tube was inserted into the canal. This metal tube was superseded by the spring-gold self-retaining tube now in use. This may be worn for a number of years and permits free irrigation by the patient.

The author is convinced that the operation can readily be performed by any properly equipped laryngologist, and has placed the percentage of recovery of properly selected cases as high as 95 per cent.

Thompson, J. A.: An Unusual Infection from Ethmoiditis. *Laryngoscope*, 1917, xxvii, 643.

The infection was one of sciatica which cleared up after opening the bulla ethmoidalis from which a few drops of pus escaped. No other portion of the ethmoid was diseased. The patient made a complete recovery. **Otto M. Rott.**

Goldstein, M. A.: Sarcoma of the Nasal Septum; Laryngo-Epiglottidean Cyst. *Tr. Am. Laryngol. Ass.*, Atlantic City, 1917, May.

The patient, a male aged 56 years, eighteen months previous had begun to be troubled with occasional obstruction of the left side of the nose, continuing about a month, followed by relief and then recurrence. There was no history of epistaxis. Lately there had been two or three attacks of nose-bleed, not very profuse. There had been no headache or pain of any kind. The patient had lost fifteen pounds in weight in six months.

Nasal examination showed a mass on the septum obstructing the left side. The right surface of the septum was infiltrated and thickened, causing some obstruction on that side. The nasopharynx was negative; the throat negative. There was no evidence of involvement of the accessory sinuses.

At operation the mass, together with the entire septum, was extirpated. Recurrence took place after one month. Histologic examination of the mass showed round cell sarcoma.

The second case, a boy twelve years old, had been hoarse since he was one month old. This had been ascribed to a "cold," and no laryngologic examination had been made. The condition seemed to remain quiescent until shortly before the boy was brought to the author for examination, at which time he had become very markedly dyspnoic. He was anæmic and frail, not cyanotic, and was unable to speak above a whisper. There had not been much difficulty in swallowing, and there was no regurgitation of food. Laryngeal examination showed a mass the size of a walnut on the left side, involving the laryngo-epiglottidean region. There

was no fever. The mass was yielding to the touch and could easily be palpated with the finger. The mass was incised, the contents consisting of clear, yellow, sticky fluid. Subsequent examination of the vocal cords, examination of which had previously been impossible because of obstruction of view by the mass, was negative. The boy regained the use of his voice, though through habit he would speak in an undertone. There has been no recurrence of the cyst to date, and the boy now speaks in a normal voice.

Cavanaugh, J. A.: A New Method of Dealing with the Nasal Septum. *Illinois M. J.*, 1917, xxvii, 161.

In his new method dealing with the nasal septum, the author advises elevating the mucous membrane on but one side (concave) except where a spur or ridge exists and then he elevates the mucous membrane on both sides only in that area. He leaves the greater part of the cartilaginous structure intact, removing with his septum shave only small strips sufficient to adjust the parts to the median line, thereby preventing the possibility of a perforation. Where the bony part is deflected he makes multiple fractures in the deflected area with his bone forceps and pushes the bony septum to the median line. In cases where the cut edges of the flaps do not come together he puts in stitches. He always packs on the side of the convexity that existed before the operation.

THROAT

Stuart-Low, W.: Contributory Causes of Cancer of the Throat. *Practitioner*, Lond., 1917, xcix, 122.

The author mentions the following as being contributory causes of cancer of the throat:

1. Syphilis.
2. Oral sepsis.
3. Acidity of oral secretions.
4. Smoking.
5. Drinking hot fluids.
6. Eating excessively salted food.
7. Nasal obstructions.

The action of the above factors is explained on the ground that they irritate or render the throat less resistant to withstand irritants, either by denuding mucosa of protecting epithelium, or by diluting or drying the protective secretion, the mucus.

OTTO M. ROTT.

Dwyer, W.: The Control of Bleeding in Tonsillectomy. *Laryngoscope*, 1917, xxvii, 688.

Where simple pressure is not sufficient to control the bleeding, the author recommends catching the bleeding point with a Carmalt clamp and making a slight traction. Then with a full curved needle held in the needle forceps and threaded with iodine catgut, a stitch is taken just above and another one just below the clamp. The second needle is threaded to the free end of the first suture. By releasing the clamp, a purse string suture is made. **Otto M. Rott.**

Mackenty, J. E.: *Surgical Treatment of Laryngeal Cancer*. Boston M. & S. J., 1917, clxxvii, 110.

Owing to the fact that very few cases of laryngeal cancer are seen early enough to justify treatment by thyrotomy, the author considers either hemilaryngectomy or total laryngectomy advisable. The author's technique is given in detail. A few of the important points mentioned are as follows:

1. The operation should be so conducted as absolutely to prevent blood entering the trachea during the operation.

2. Wound contamination from the open trachea and pharynx should be guarded against.

3. In total laryngectomy two lines of drainage are indicated: one just below the pharyngeal closure and the other just behind the tracheal stump, where it is secured to the skin. The latter is of prime importance, crossing, as it does, the direct path of mediastinal infection. In this situation, unprotected, weak iodoform gauze is used to promote adhesions. If the infection from above can be delayed a few days, and in all of the author's infected cases it has been so delayed, the danger zone behind the trachea is eliminated and a primary union between the trachea and skin promoted.

4. A nourishing and properly balanced diet is essential from the start. The only means of accomplishing this is by the use of the feeding-tube, introduced into the oesophagus through the nose and left in place until the wound is healed. In one case the patient was thus fed for two months without producing oesophagitis.

5. When infection occurs, strict attention to drainage is imperative. The dressings should be changed every two hours, or oftener, during the day and every three or four hours during the night. At each dressing a negative pressure pump is used to remove the pus and tenacious mouth and pharyngeal secretions from the wound.

6. When arytenoids are involved, it is almost certain that the disease has entered the lymphatics of the neck, necessitating their removal. If the median line is encroached upon, the dissection must include both sides.

7. As much of the anterior wall of the oesophagus as conditions demand should be removed. As much as one inch downward anteriorly and one-third of the circumference may be removed without producing subsequent stricture.

8. Diseased teeth should be removed at a period as long before the operation as possible.

9. In total laryngectomy the one-stage operation is preferred.

OTTO M. ROTT.

MOUTH

Munger, C. E.: *Tuberculoma of the Tongue*. *Tr. Am. Laryngol. Ass.*, N. J., 1917, May.

The case is reported of a male, aged 30 years, whose tongue presented a crater-like cavity situated on the dorsum, at the junction of the middle and posterior thirds, in the median line, the prebase of the tongue. At the bottom of the crater was a marked ulceration covered with a yellowish slimy secretion, and from the central ulceration were narrow sharply marked ulcerations radiating to the circumference of the thickened and indurated mass.

The surface of the swollen mass was yellowish in color, and there was marked and exquisite tenderness upon the slightest pressure, with much pain at every movement of the tongue. This pain was localized and not radiating when the tongue was at rest. There was present also nigrities.

While the tubercular ulcer may be primary or secondary, a primary tubercular lesion of the tongue is extremely rare; although a few cases of tubercular infection of the tongue following traumatism have been reported. Speaking generally, the tongue is more often inoculated from the lungs than the lungs or larynx from the tongue.

The case reported presented a marked deviation from the usually reported situation of tubercular lesions on the tongue, which have almost invariably been stated to occur either on the tip or sides, this one being on the dorsum, a site on which a gumma is usually found.

The prognosis is not dependent upon the lesion itself, but depends wholly on the decision as to whether the patient is suffering from concurrent lesions in other parts of the body which are not susceptible to improvement, or is suffering from pulmonary tuberculosis, where there is a tendency to fibrosis. If the latter is the case, there is a fair degree of certainty that the tongue lesion may heal without local therapy, but if the pulmonary process is acute, with caseation and necrosis active, there is little chance of the tongue healing.

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SURGERY OF THE EYE AND EAR

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SURGERY OF THE NOSE, THROAT, AND MOUTH

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INTERNATIONAL ABSTRACT OF SURGERY

MARCH, 1918

COLLECTIVE REVIEW

WAR INJURIES OF THE BLOOD-VESSELS

By DANIEL N. EISENDRATH, A.B., M.D., F.A.C.S., CHICAGO, ILLINOIS

THE number of wounds of the blood-vessels during the present war has been far greater than that of all previous wars of which we have a record. During the Franco-German war of 1870-71 only forty-four aneurisms were reported on the German side. During the Russo-Japanese war eighty-eight were reported, while on the Serbian side alone during the Balkan wars of 1912, Soubotitch (85) was able to collect 105 aneurisms. As early as September, 1915, Zahradnický tabulated three hundred and forty-eight aneurisms reported by the surgeons of the armies of the central powers. Since this contribution a large number of cases have been reported by Makins (60), Bier (9), von Eiselsberg (69), Swan (quoted by Cowell, 21), and many others. This striking increase in the number of blood-vessel injuries is due to the difference in the character of the weapons and missiles employed during the present and the Balkan wars as compared to those used in all previous wars. In the latter campaigns the majority of these injuries were due to penetrating, e.g., stab wounds. The large number of blood-vessel injuries during the present war are due to the use of metal-covered bullets and of explosive shells and bombs. Kuettner (51) believes that the shell fragments cut the vessels like a knife and cause external bleeding, while aneurisms occur more frequently with the steel-jacketed bullets.

NATURE OF WOUNDS

Blood-vessel injuries can be best divided into: (a) contusion, (b) penetrating injuries, (c) dry wounds, (d) arterial or arteriovenous aneurisms.

(a) *Contusions.* That a contusion alone of an artery or vein does occur can no longer be doubted. A localized or diffuse thrombosis may take place even when the wall is only contused (Makins, 60) and result in gangrene, secondary hæmorrhage or embolism, the latter being especially frequent in localized thrombosis. Thrombosis from contusion is more commonly observed in veins than in arteries and less trauma is necessary to produce it.

(b) *Penetrating injuries.* The more or less complete severing of an artery is more frequent today than a perforation involving both sides of the lumen. Such a through and through injury occurs oftener in veins than in arteries. In the latter a frequent form of injury is a lateral puncture of the vessel wall because wounds produced by fragments of shells and bombs (Makins, 60) more nearly resemble incised wounds, frequently being merely minute punctures. Simultaneous occurrence of an injury to a blood-vessel and of a fracture is a serious combination because the opening in the vessel may be tamponed by the bone fragment and hæmorrhage occur during transport by loosening of the fragment. Similarly a thrombosis of the perforation may occur at the time of injury and secondary hæmorrhage occur as the result of the dislodgement of such a plug in the vessel wall. Sencert (82) says that in the case of a wound of one of the large vessels the life of the patient depends upon the extent of the cutaneous lesion. If this is large, death occurs as a rule; if it is small, the blood may escape into a neighboring splanchnic cavity or it may fill the surrounding tissues. In a certain number of

cases the hemorrhage is insignificant and there is spontaneous hæmostasis. This is more frequently observed in cases of complete section of the vessel than in lateral wounds and also in cases where the vessel has been subjected to contusions and ruptures of its interior coat. He has observed twenty cases of injuries of the axillary, femoral and popliteal vessels arriving at the ambulance in which there was already spontaneous hæmostasis.

(3) *Dry wounds of vessels.* Some very important reports of so-called "dry wounds" of vessels have recently appeared in the French literature. Fiolle (28) says that these "dry wounds" occur oftener than is generally supposed. He has observed seventeen in six weeks. The brachial artery is most often involved, and the projectile, always a piece of shell, pushes or drags the vessel rather than cuts it so that it ruptures when it exceeds the limits of elasticity. It is possible that the heat of the projectile is an important factor in causing spontaneous hæmostasis. Complete section of an artery occurs in these "dry" cases more often than lateral wounds. The piece of projectile may act as a tampon and stop hemorrhage or the end of the vessel be closed by a thrombotic plug. Sometimes a "dry" wound is found with no mechanism to explain it. Such "dry" wounds are a frequent source of secondary hemorrhage.

In a more recent paper Perrenot (73) reports four cases in all of which a clot strong enough to prevent the escape of blood from the completely severed vessel was found. He believes that these "dry" wounds occur oftener when the projectile is a piece of shell than a bullet. The latter makes a clean wound with considerable hemorrhage and the development of a hæmatoma, while shell injuries give rise to contused wounds in which a large injured vessel may be incorporated in the lacerated tissue, and even if the vessel be completely divided, its coats are strongly compressed against each other by one of the surfaces of the projectile.

The frequent occurrence of these "dry" wounds without immediate hemorrhage but tardy bleeding, e.g., eight days in a case of Planson's, shows the necessity of a thorough systematic exploration of the vessels of the region when the site and direction of the wound excite suspicion as to the nature of the lesion. Hours or weeks may elapse between the time of injury and the hæmorrhage. I shall refer to the symptoms of these "dry" wounds in the section on *Diagnosis*.

(d) *Arterial and arteriovenous aneurisms.* Arterial aneurisms may follow contusions of the vessel

wall as well as penetrating wounds. The first effect of a contusion is to cause the wall to become thinner; then a thrombus forms. The seat of injury gradually yields and an aneurismal sac forms.

In general the term aneurism should only be applied when there is a well-formed sac, and not applied to the first stage in which only an arterial hæmatoma is found. The evolution of an arterial aneurism is usually as follows: At the time of injury there is a considerable primary spurt of blood but this ceases spontaneously, except in the case of the largest vessels of the trunk. Aside from this external hæmorrhage the most common sequel of an arterial wound is the formation of a hæmatoma whose size depends upon the resistance of the tissues. If the clot becomes firm there may be danger of gangrene from pressure on the collateral vessels (Makins, 60). The hæmatoma usually becomes encapsulated within two to three weeks by a sac formed from the connective tissue of the immediately adjacent structures. This sac is lined by endothelium and the ragged edges of the wound in the arterial wall become smooth (Fig. 11).

Graf (31) found that only a minority of his forty-three cases encapsulated to form aneurisms. The majority began to bleed from the second week on. The opinion of Graf is not shared by any other writer, the majority believing that if the patient does not die from the primary hæmorrhage, an aneurism will form or gangrene occur (Exner, 27).

Arteriovenous aneurisms, it may be concluded from a study of the statistics of various writers, have been found more frequently than those of the pure arterial type, especially in the larger vessels. Bier (9) in one hundred and two war aneurisms found that forty-five were arterial and fifty-six of the arteriovenous variety. In one case a single bullet had caused three aneurisms, one of the subclavian and the innominate arteries respectively, and an arteriovenous of the subclavian artery and vein. Makins (60) has observed a similar case. Swan (quoted in Cowell, 21) found that in one hundred and forty-six recently published cases, one hundred and six were arterial aneurisms and forty of the arteriovenous variety. In the larger vessels the proportion of arteriovenous to arterial aneurisms is greater than in the smaller vessels. Makins (60) has found that arteriovenous aneurisms occur far less frequently than the pure arterial variety.

There are four chief forms of arteriovenous aneurisms (Fig. 2), viz.: (a) There may be a pure perforation of the artery and vein, which

is rare, the sac being either on the distal side of the artery or between the two vessels. (b) Complete division of both artery and vein may occur with the formation of a common cavity into which the four vessels open. This retains the form of a hæmatoma for some time, extends rapidly, and gangrene or secondary hæmorrhage are not uncommon. Such cases are not numerous, and generally demand early surgical treatment, either on account of rapid extension, or the occurrence of one of the complications indicated. (c) In the great majority of cases the wound in the artery is lateral in character, associated either with a lateral wound, a double perforation, or a complete division of the vein. (d) The sac may sometimes depend mainly on the venous injury, the vein being widely opened or completely divided, while only a small opening persists in the artery. In such cases the wall of the sac is thin and ill developed.

The occurrence of a pure aneurismal varix, i.e., a direct lateral anastomosis, usually follows the passage of a missile between the artery and vein. Cases of varicose aneurism where a sac forms between the artery and vein are more common than those of direct anastomosis of the two vessels, i.e., aneurismal varix. The close proximity of the popliteal vessels, of the femoral vessels and to a less extent in the groin, and of the vessels in the carotid sheath account for the greater frequency of aneurismal varices (Fig. 3) in these regions than elsewhere, according to Matas (Keen's Surgery, Vol. V).

The sac of a varicose aneurism scarcely ever contains a clot, because the circulation is too active to permit of the formation of a clot. The interior of the sac, like that of an arterial aneurism, is lined by a smooth layer of endothelium which has formed by proliferation from the interior of both vessels.

The distant and remote effects of arteriovenous anastomosis will be marked in proportion with the importance of the vessels involved. It is important to bear in mind, however, that the aneurismal varices of the neck and upper extremities are especially well tolerated; they give rise to comparatively little subjective disturbance, except the noises, which sometimes are heard by the patients themselves. In the lower extremities the effects of the oversupply of blood and damming back of the venous circulation are more pronounced.

COMPLICATIONS OF VESSEL INJURIES

Makins (60) found that the most common of these are symptoms dependent on the pressure

of the effused blood and clot on neighboring structures, the development of peripheral gangrene, the occurrence of secondary hæmorrhage, the detachment of emboli from the thrombus, and very rarely the sequence of inflammation from secondary infection. These complications occur, usually, comparatively early, before a definite false aneurism has formed.

Secondary hæmorrhage may occur after two or three days, or later, after about ten days. The earlier variety is the less important. The latter form of secondary hæmorrhage is vastly more dangerous. It may show itself in two forms, either a rapid extension of the swelling in the limb, or as an external hæmorrhage. It is rare for this form of hæmorrhage to depend on septic infection of the aneurism itself. It rather appears to depend on a defective effort at localization which allows some part of the limiting boundary of the clot to give way, often as a result of infection of the surrounding tissues, or as a result of a rise in the general blood-pressure accompanying increased activity, and perhaps from free movement of the limb on the part of the patient.

Schloessman (79) is of the same opinion as Makins (60) and thinks that all late hæmorrhages are due either: (a) to erosions of vessels, or (b) to primary vessel injury. The former (erosions) may be due: (a) to a fragment of a fracture which has tamponed the vessel and become displaced; and (b) to infection, especially after shrapnel injuries; then it is venous in origin.

Secondary hæmorrhage, especially in the "dry wounds" referred to previously, may be due to the detachment of the clot plugging the end of the vessel, or again hæmorrhage may occur from the elimination of a necrosed piece of tissue which opens a contused vessel. Gregoire (33) urges for this reason that no patient with a vascular wound should be discharged without a proper operation.

EFFECTS OF BLOOD-VESSEL INJURIES

This question has been especially studied by Makins (60). He found the heart excited and apparently enlarged after wounds of the vessels, this being more marked when there was an arteriovenous communication than after a simple arterial wound. Quite pronounced cardiac murmurs are present for a short time but gradually disappear. They are due to the transmission of the aneurismal bruit to the heart and are most frequently observed in carotid and femoral aneurisms, but never in those of the arm.

In arteriovenous aneurisms there is always dilatation of the superficial veins resulting in varicose enlargements and ulcers. Pain may be

a very marked symptom if adjacent nerve-trunks are compressed or are later included in the cicatrices following absorption of the hematoma.

Gangrene may result from pressure upon the collateral circulation of the artery involved (Makins, 60).

It is evident that the greater the deviation of the blood-stream, the more marked will be the effects of venous obstruction and arterial ischæmia. These local effects are manifested as varices and oedema, followed by thickening and connective-tissue hyperplasia. Sometimes an elephantiasis condition develops as the result of persistent venous and lymphatic stasis. Dusky discoloration or cyanotic hue in the legs has occasionally been noticed.

SYMPTOMS AND DIAGNOSIS

1. *Signs of arterial aneurisms.* All observers agree that the murmur is louder and harsher in traumatic aneurisms than in those due to disease of the vessel wall. The murmur is heard more widely in a distal than in a central direction in arterial aneurisms, while in the arteriovenous variety the murmurs are conducted in both directions, i.e., toward the heart as well as distally. The systolic murmur in an arterial aneurism varies greatly in intensity, depth of tone and musical character, according to Makins (60). It is loudest where the artery and sac communicate; as the opening in the vessel wall becomes smoother and the aneurismal sac more perfectly formed, the murmur becomes softer and deeper. During the early stages of the formation of an arterial aneurism, i.e., during the hematoma stage, the pulse in the limb is rapid and weak and may be obliterated owing to pressure of the clot on the vessel. Makins (60) strongly emphasizes the importance of auscultation as a means of determining the existence of a patent opening in the wall of an artery since it is the only method of making a positive diagnosis in some cases, e.g., where no pulsation is to be detected in a swollen thigh or calf. The expansile character of the pulsation is never as marked in a traumatic as in an aneurism due to disease.

2. *Signs of arteriovenous aneurisms:* (a) *Bruit.* This may be short or harsh or even slamming like the whirr or buzz of machinery. The loud systolic murmur is conducted widely, usually peripherally, and to a much less extent centrally. The diastolic roar is conducted in either direction, but as might be expected, more freely in a central direction in the vein. In some instances the murmur may be conducted by the whole mass of the tissues of the limb, and be audible wherever the stethoscope is placed upon the surface. The height of the pitch

of the murmur is a valuable guide to the exact site of the arteriovenous communication. It is highest and loudest immediately over this spot, the tones gradually softening and deepening in either the upward or downward direction as the stethoscope is moved along the lengthening column of blood in the course of the vessels.

(b) *Thrill.* This is not a valuable localizing sign and is in no way comparable to the pitch of the murmur as indicating the actual point of communication of the artery and vein. It is intensified with each cardiac systole. When the murmur and thrill are present together the diagnosis is unmistakable. When an arteriovenous aneurism exists in the subclavian, the murmur and thrill will be heard in all of the superficial veins of the neck and arm down to the hand. In the femoral region the thrill will be transmitted to the ankle below and umbilicus above. The combination of a purring thrill, continuous buzzing murmur reinforced at each systole, wide centrifugal transmission of the murmur and pulsation, and evidences of stagnation of the superficial veins clinches the diagnosis of arteriovenous aneurism, according to Matas (Keen's Surgery, Vol. V).

The differential diagnosis between aneurismal varix and varicose aneurism can only be made clinically when the vessels are situated superficially. Aneurismal varix is characterized by the presence of a vaguely outlined hemispherical swelling, which may be felt through the skin or the cicatrix, and rarely exceeds a walnut in size. It can be made to disappear by gentle steady pressure. It may also be made to disappear by compression of the main artery on the proximal side, the swelling reappearing after the removal of the compression. Compression below, on the artery or vein, will increase its size and intensify all the aneurismal signs. If the point where the thrill and murmur are heard with the greatest intensity is compressed directly, all the physical phenomena will cease at once (Vanzetti's sign).

In varicose aneurisms the tumor formed by the intermediary sac is larger; it cannot be altogether reduced, either by direct compression or by compression on the proximal side of the artery. Vanzetti's sign cannot be obtained as readily as in varicose aneurism.

From arterial aneurisms the differential diagnosis is made by the purring thrill and the continuous "machinery" bruit, which is reinforced by every systolic contraction and is propagated centrifugally and centripetally along the veins. In addition to the absence of all these accessory signs, the murmurs heard in arterial aneurisms

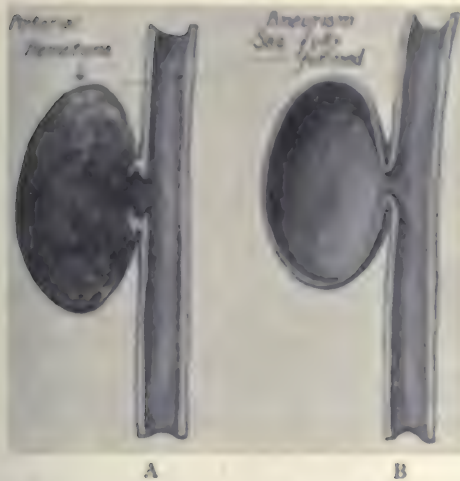


Fig. 1. Stages in the evolution of an arterial hematoma following gunshot wound of an artery, or of both vein and artery, to form a traumatic aneurism.

(a) A large hematoma lateral to the vessel communicates with lumen through a wound in wall of artery. Note ragged character of arterial wound in early stage.

(b) Aneurism fully formed. Note smooth character of interior of sac and the rounding off of the edges of wound in artery.

are *intermittent* and heard only during the cardiac systole.

Differentiation of arterial and arteriovenous aneurism is based upon the absence in the former of disturbances in the venous circulation, lack of pulsations in the veins, absence of thrill and loud purring and of vibratory murmurs transmitted laterally along proximal and distal veins.

(c) *Signs of "dry" wounds.* Both Fiolle (28) and Perrenot (73) agree that the signs are quite deceptive. The principal ones are absence of the pulse distal to the point of injury, radioscopic evidence of the projectile, and the location of the injury. The latter should always arouse suspicion if it is in the path of the vessels of the region involved. When such a "dry" wound is diagnosed or even considered, the orifice of entry should be ignored and the usual incision for exposure of the vessels made. One must remember that absence of the pulse may also occur in contusion with thrombosis of the vessel. The most reliable method of diagnosis in these "dry" wounds is an exploratory incision.

HOW TO TEST THE COLLATERAL CIRCULATION OF A LIMB

The Moszkowicz (64) test has been depended on by some observers (43) in order to determine whether gangrene can be avoided after opera-



Fig. 2. Types of arterial wounds (Makins).

(a) Oval wound of femoral artery close to a lateral branch.

(b) Complete division of both artery and vein. Note thrombosis of both vessels.

(c) Unusually long lateral wound of axillary artery. Note the branch arising immediately opposite the center of the wound.

(d) A three-fifths division of the femoral artery. This form is frequent and amounts practically to a three-fifths division of the femoral artery but spontaneous thrombosis is less likely to occur than when vessel is completely severed.

tions for aneurisms. By raising the extremity while the main artery is compressed and then lowering the limb again, one can observe a marked hyperæmia of the skin below the point of compression which lasts for several minutes. This gives one a fair test of the degree of collateral circulation. It is more reliable in arterial than in arteriovenous aneurisms because in the latter there is already existing venous hyperæmia.



Fig. 3. Wounded popliteal artery and vein, followed by gangrene of the leg (Makins).

The wound in the artery involves nearly half its caliber and gaps widely, resembling a hole in a dute, the margins of the opening are comparatively smooth. A characteristic traversing perforation of the vein is shown, the shape of the openings being irregularly circular and less symmetrical than similar wounds produced in the artery. The extravasated blood from these wounds had clotted firmly *en masse*; no murmur was audible in the swelling formed by the clot. Gangrene of the leg and foot was definite on the fourth day.

PROGNOSIS

This depends on the character of the injury, i.e., whether purely arterial or arteriovenous. If the patient survives the primary loss of blood, i.e., with excess of an external hemorrhage, the outlook becomes more and more favorable from week to week provided that secondary hemorrhage does not occur from mechanical dislodgment of the thrombotic clot or as the result of infection. The danger of gangrene from compression of the collateral circulation by the hematoma has already been referred to. Two factors make the establishment of collateral circulation difficult: (a) the pressure of a hematoma on the soft parts and the collaterals therein, and (b) infection which increases the tension and

favors thrombosis of the collaterals. Both of these according to Exner (27) favor gangrene.

A factor in the prognosis which must not be overlooked is the frequency with which cases of blood-vessel injuries in the early stages complicated by infection are erroneously treated for the latter and the underlying vessel injury ignored until it is too late to save life, the patients often dying in the night by bleeding into their dressings during sleep.

The prognosis in aneurismal varices is much better than in varicose aneurisms (Fig. 4). The former tend to remain stationary, but with the latter, spontaneous cure is practically unlikely because spontaneous coagulation of the sac contents cannot occur owing to the great activity of intra-aneurismal circulation. In the lower extremity where the evils of venous stasis combined with arterial ischaemia are much more severely felt than in the upper extremity, interference is justified (Matas) before the evil effects of the varicose state have been fully established. Exner (27) from his experience in the Balkan wars believes that varicose aneurisms have a tendency to develop further and may rupture, causing death. Those of the neck are more serious than in the femoral region.

TREATMENT

This is to be considered under the following headings:

1. Circular or lateral suture at the time of injury.
2. Ligation of vessels immediately after injury.
3. Treatment of fully formed aneurisms.

1. *Circular or lateral suture (immediate).* The conditions under which the injuries have been received during the present war are most unfavorable to immediate suture or circular resection and suture of the torn vessels. This would be the ideal method of treatment, but can rarely be employed because the facilities for operating such cases are not to be secured at the advanced dressing posts and by the time that the patient reaches the casualty clearing station the external hemorrhage has usually been spontaneously arrested. The majority of surgeons on both sides believe that patients with blood-vessel injuries should be transported as little as possible until the period when an aneurism has been formed, i.e., after three to five weeks, and then should be transferred to the base hospitals for operation. I have been unable to find any reports of successful sutures performed immediately after the

injury; except the five successful cases of Jeger (*Berl. klin. Wchnschr.*, 1914, li, 1907).

2. *Ligations above and below injury (immediate).* There is still considerable difference of opinion in regard to the question of immediate ligation. Makins (60) believes that it is often followed by a lack of compensation on the part of the collateral circulation and also that such operations must be performed at a time when the patient is suffering from a loss of blood. This is especially to be considered in the case of ligation of the common carotid artery, which is followed by cerebral softening to a degree quite unapproached by the after-results of operations for aneurisms of lengthy duration. Makins believes that an arterial hæmatoma should be treated by rest and an expectant attitude. Ligation of the artery at an early date is objectionable if it can be avoided. Not only has the collateral circulation not acquired sufficient compensatory enlargement, but the conditions for the proper fulfillment of this process may be seriously interfered with, either by pressure from the blood clot around the wound in the vessel, or still more seriously by concurrent wounds or laceration from tearing of some of the collateral branches themselves. As a result of these conditions, under the best of circumstances the general nutrition of the limbs suffers permanent injury, and actual gangrene is not infrequently the result. Beyond this, if wounded collaterals lie in the wall of the cavity of the hæmatoma, they may not bleed at the time of ligation of the main trunk, and hence are a not infrequent source of secondary hæmorrhage. The large majority of the hæmatomata eventually become false aneurisms. There should be no material difference in the early treatment of arteriovenous aneurisms.

Exner (27) from the experiences of the Balkan wars agrees with Makins (60) that it is best to wait until the aneurism stage because if the nutrition of the limb is good and there is no secondary bleeding, a sterile case is best left alone; early ligation does not allow the collateral circulation to form and also one cannot secure aseptic conditions for either ligation or suture at advanced stations. Exner employed suspension, mild compression and fixation, and was able to successfully guide and operate twelve out of twenty-four cases into the aneurism stage; the rest either required amputation or died.

Sencert (82) advises far more radical early treatment than Makins or Exner and advises operating for diffuse hæmatoma at once in order to remove the danger of ischæmic or infectious gangrene, even if the external wound is quite

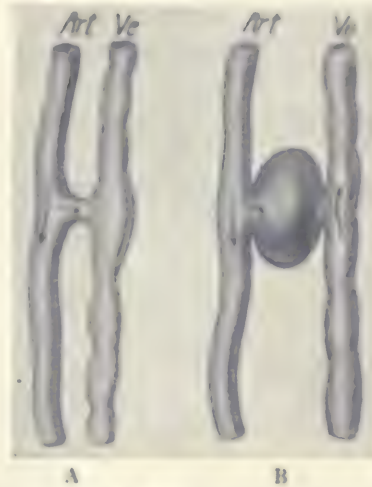


Fig. 4. Diagrams of arteriovenous aneurisms (Matas).
(a) Direct communication of the artery (art) and vein (ve); aneurismal varix.
(b) Intermediary sac between the artery (art) and vein (ve); varicose aneurism.

minute. He passes a heavy catgut ligature around the artery above the hæmatoma and depends upon traction of this ligature to stop the hæmorrhage while the hæmatoma is evacuated and the vascular lesion when uncovered is ligated.

Sencert has operated upon forty-two hæmatomata. Of those involving dangerous arteries, five cases of hæmatoma of the axillary region gave one death and two cases of gangrene; nine cases of hæmatoma of the thigh gave two deaths and two cases of gangrene; five cases of hæmatoma of the popliteal region gave two cases of gangrene. Simultaneous ligation of the vein does not increase the danger of gangrene.

Cowell (21) agrees with Sencert in regard to simultaneous ligation of the main artery and vein of a limb, and reports seven cases which show the beneficial results of such treatment, viz., of ligating the main vein where the corresponding artery is injured beyond repair; only one of the seven required amputation.

Makins (*Brit. M. J.*, February 17, 1917) believes such simultaneous ligation is of benefit whether the vein is injured or not, because: (a) the vein offers a too ready exit for the diminished arterial supply, and (b) permits a smaller amount in the collateral circulation to be retained in the limb for a longer time.

Swan in discussing Cowell's paper (21) advocated expectant treatment for some weeks for blood-vessel injury unless a rapid increase in the swelling or increasing pain from pressure upon



Fig. 5. Intrasaccular suture of the orifice of communication between the aneurysmal sac and the injured artery. This is the restorative endo-aneurismorrhaphy of Matas. (Illustration taken from Matas' article in Vol. 2, Keen's Surgery.)

the nerves should compel one to operate earlier. Swan's statements seem most logical when he says that if an arterial hematoma is opened it may be very difficult to pick up the injured vessel, whereas a proximal ligation at the point of election is to be avoided because the collateral circulation has not had time to establish itself. The hemorrhage may be from a main branch and not from the main trunk and ligation of the latter may be followed by gangrene.

The advice not to ligate early after an injury is also endorsed by von Bonin (15), Hotz (43), Matas, and many others.

Hotz observed hemiplegia in five of six ligations of the common carotid and gangrene in four of six femoral, axillary and popliteal ligations.

Gebele (30) believes that immediate ligation is indicated for smaller vessels where the interruption to the circulation is not endangered. The only other surgeons who endorse the opinion of Sencert for immediate ligation are Barbarin and Lerat (5) and Donati (24). The former reports twenty-three cases, of whom twenty-two recovered after ligation performed within three hours after receipt of the injury, but of this number three required amputation, one on account of the bone and joint injuries, one on account of gangrene, and one for gas bacillus infection. Donati (24) also advises immediate operation if a vascular lesion is diagnosed.

3. *Treatment of fully formed aneurisms (arterial and arteriovenous).* As in the case of the question

of the immediate treatment of vascular injuries, there is still considerable difference of opinion as to a uniform method of treating a fully developed aneurism. This diversity is largely a matter of individual experience and there will probably always be a number of procedures, all leading to an equally good end-result.

The methods employed by practically every surgeon in the treatment of traumatic aneurisms during the Balkan and the present war are one of the following:

1. Ligation above and below the sac.
2. Intrasaccular ligation of the orifice of communication of the injured artery with the sac.
3. Suture of the orifice of communication of the injured artery with the sac (Matas endo-aneurismorrhaphy).

The general tendency today is to disturb the peri-aneurismal tissues as little as possible, i.e., to do all operative work within the sac. Prophylactic hemostasis is usually necessary and is secured through the application of an elastic constrictor. It is not necessary to freshen the edges of the orifice in the sac before suturing or ligating it. The method of intrasaccular ligation was first suggested by Annandale and modified by Kikuzi during the Russo-Japanese war. It consists in opening the sac, removing all clots, passing a probe into the main artery, and with the aid of an incision on each side of the orifice of communication, to pass a catgut ligature around the orifice in the sac.

The Matas operation aims to close the opening in the sac after removal of the clots by a continuous catgut suture (Fig. 5).

In the following quotations from the current literature of war aneurisms the two methods just described will be referred to as the intrasaccular ligation method and the suture method respectively. Both operations aim to disturb the collaterals as little as possible.

Makins (60) believes that an expectant attitude should be the method of choice for some weeks. If during this time steady decrease in size and increase in the firmness and solidity take place, a much longer period should be allowed to elapse, in the hope that spontaneous consolidation of the sac, with persistence of the lumen of the artery, will supervene. Such an occurrence is not very rare, and the result is far superior to any obtainable by ligation or excision, and probably in no way inferior to that to be attained by successful suture of the opening in the arterial wall. Again, the later the date, within reason, at which the operation is undertaken, the better are the prospects of finding the vessel sufficiently free in the

vascular cleft to allow a fair trial of the operation of suture.

There is no material difference in the early treatment of arteriovenous aneurism; it needs only to be borne in mind that spontaneous cure is not likely to occur. A local operation, with ligation of both vessels above and below the communication, or some form of suture, is the proper treatment for the condition. Aneurismal varices never need early treatment, and it is rare that an operation is required at a later date. The communication may close spontaneously, even after a long interval. Operation is needed most often in the lower limb, and should be of the same character as that recommended for arteriovenous aneurisms.

Exner's results (27) in the Balkan wars are of interest in connection with the expectant method of treatment. Of twenty-four cases, twelve were so treated until they reached the aneurism stage and all recovered. The remaining twelve either required amputation or died.

Soubbotitch (84) is a warm advocate of the Matas suture method. Schwieker (80) and Pearson (71) on the other hand both hold that suture is impossible in the majority of cases and that intrasaccular ligation is the most suitable method: (1) if the artery is small, unimportant, or difficult of access; (2) if there is infection in the scar; (3) if the extent of the injury is such that suturing or end-to-end anastomosis is impracticable, or very difficult; (4) if the adjacent walls of the artery are injured or diseased, in which cases thrombosis or hæmorrhage will probably follow an attempt at suturing; (5) if the patient's condition is such that any prolongation of operation or anaesthesia is undesirable.

The best time to operate is when the surface wounds are healed, in two to four weeks; but one must intervene earlier if there are signs of infection in the sac, hæmorrhage, rapid increase in the size of the aneurism, severe persistent pain or signs of pressure on adjacent structures. Silk is used unless infection is present, then Pearson employs catgut. Many cases of arteriovenous aneurism require no treatment. Aneurismal varix requires (a) division of the connection between the artery and vein and then a suture of the opening in each; (b) ligation of the artery above and below the anastomotic opening and ligation of the intervening branch. Varicose aneurism should be dealt with where possible by the intrasaccular route, opening and clearing the sac and dealing with wounds in the vessels as required. Ligation of an important vein and artery at the same time should be avoided; if one must be

sacrificed it should be the artery rather than the vein, except in the case of the internal carotid artery and internal jugular vein.

Cowell (21) and Makins (60) have shown that such a simultaneous ligation of the main artery and vein of an extremity, at least, is not followed by gangrene.

Von Haberer (36) had seventy-two operative cases; five died, sixty-seven recovered, but two required later amputation. The ideal method is suture, circular rather than lateral because the latter narrows the lumen too much and there is greater danger of thrombosis. Suture is not indicated in very small arteries where ligation assures a collateral circulation. He thinks that there will always be cases in the large arteries where ligation must be done, e.g., where large lateral defects or severe infection are present. If ligation is necessary it must be made within the sac or close to it, taking the utmost care of the collaterals. The best time for operation is from two to three weeks after injury unless hæmorrhage or severe infection intervene. The strength of a vascular suture is very great and enables the soldier to return to heavy work much earlier than ligation. Paralysis of nerves is a frequent occurrence, due to pressure of the aneurism.

Bier (9) in reporting one hundred and two war aneurisms at the Brussels meeting in 1916 also warmly recommended the suture method. This was done in seventy-four cases. In arterial aneurisms lateral suture is easy, the sac being opened, clots removed, the orifice freed and sutured. Operation in arteriovenous aneurisms is more difficult. In thirty-six cases it was necessary to resect and make a circular suture. In all cases the arterial stumps can be united directly by suture because the opening in the artery is very small. The artery runs along the lateral aspect of the sac and can be easily dissected out, even if cicatrices are thick. Even the veins can be freed. It is a cardinal rule that even if the arterial wall is thickened by cicatricial tissue, it is not necessary to go beyond the opening in the artery because the adventitia is chiefly involved in the scar tissue. Circular suture is possible even in large arteries. The difficulty of aneurism operations is not in suture *per se* but in the anatomical dissections of the same. He has only tried circular suture once in veins; in the other cases the openings in the veins were closed in a longitudinal manner. Where large veins ran through infected sacs they were doubly ligated to prevent pyæmia. He advises against suturing the artery if infection be present. Even apparently aseptic sacs may be infected; this is the only

danger of suture. One should never ligate if one can suture.

Zabradnicky (94) collected 425 cases of war aneurisms operated upon by forty-five surgeons in the Balkan and present war. Gangrene developed in 28, or 11.5 per cent, of 242 ligations and necessitated amputation. In 182 sutures gangrene made amputation necessary in 7, or 3.7 per cent. The mortality by the two methods was about the same, viz., 7.4 and 7.1 per cent. Ligation was followed by gangrene three times as often as after suture of the vessels. Suture would give even better results if an early operation were done before adhesions had formed and when there was not so great tendency to thrombosis.

Von Eiselsberg in the discussion of Ober's paper (60) reported sixty-five cases of which he had done lateral or circular suture in twenty. Five of the sixty-five died. He believes suture the ideal method. During the Balkan war the consensus of opinion was ligation and extirpation of drainage of the sac, but in the present war, suture is considered preferable.

Swan (in Cowell's discussion, 21) said he had been unable to suture most of his twenty-three cases. He thinks one should aim to reconstruct the lumen of the injured vessel by suture, and when this is not feasible, ligate above and below the injury, empty and obliterate the sac by suture. By opening the sac one is sure that no branch leads into it which would keep up the aneurism. Operation is seldom needed in direct fistula between artery and vein, but only when they communicate through a sac. If immediate suture is impracticable, then he ligates the artery and vein above and below the sac.

Von Bonin (15) reported seventeen cases, five arterial and twelve arteriovenous. In the latter he performed one lateral and eleven circular sutures, and in six of these veins were transplanted. Eleven had primary union without sequelæ. He prefers circular suture with a vein transplant. Secondary hemorrhage is to be most feared from the superior gluteal in pelvic wounds.

Holz (43) has sutured in seven aneurisms and implanted segments of veins in five. In one he ligated later on account of secondary hemorrhage; all others healed uneventfully. Better collateral circulation is obtained in regions where large masses of muscles have to be provided for than where chiefly ligaments and tendons are to be supplied, this accounts for the high percentage of necrosis after ligation of the popliteal artery.

We thus see that it is too early in the present war to arrive at any definite conclusion in regard to the choice of method in the treatment of war

aneurisms; and only a large statistical report at some later period will serve to give one an idea of the relative value of the various procedures.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

ASEPTIC AND ANTISEPTIC SURGERY

Morison, R.: Remarks on the Treatment of Infected, Especially War, Wounds. *Brit. M. J.*, 1917, ii, 503.

Morison says that he could not have believed two years ago that it would be possible to treat large infected wounds in such a manner that they would require no special drainage, that they could be safely closed by suture at any period of their progress, and that the dressings used for them could be left unchanged for from one to six weeks with a knowledge that healing was making steady progress. There can be no doubt now about any of these statements because each has been proved in hundreds of instances both by Morison and others.

These results have been achieved by thorough cleansing of the wound and surrounding parts and by the use of bipp paste. The paste is prepared as follows:

Iodoform, 16 oz., bismuth subnitrate, 8 oz., liquid paraffin, 8 fl. oz., or a sufficient quantity, are used. The powders are mixed in a mortar and the paraffin incorporated. The quantity of paraffin must be sufficient to form a paste. The paste is then rubbed down on a slab with a spatula. Bismuth and paraffin are sterilized by dry heat at a temperature of 120° C. for half an hour. Mixing is done in a sterile mortar. Paraffin is added at a temperature of 90° C. The paraffin used is a mixture of liquid paraffin 40 parts and of the solid, melting at 45° C., 10 parts.

Iodoform or bismuth poisoning can be prevented by removing all excess of paste. As both are opaque to the X-ray, unsatisfactory plates of fractures and of foreign bodies may result.

Some of the failures Morison has seen have been due to faulty surgery, and the technique is seldom carried out entirely as suggested. He therefore calls attention to some of the following important features of technique.

It is desirable to see the bottom of all wounds, but occasionally it may be unwise. Through and through wounds need not be excised. They may generally be cleansed by drawing a long strip of gauze through, then pulling it to and fro. Next a strip of gauze soaked in alcohol is pulled through, then one smeared with bipp. The fresher the wounds, the better they react to the treatment. For suture, silkworm-gut or preferably silk rubbed with bipp is used. The greatest triumphs of the

method have been with large infected wounds bipped and then sutured. All of Morison's cases are so treated unless the wound is small or superficial. Occasionally there have been "flares" from omitting the treatment in cases of compound fractures of femurs apparently doing well.

In gunshot wounds of the knee-joint of some duration that are not doing well, or in those complicated by fracture, Morison first applies extension straps below the knee, disinfects the skin, applies a tourniquet and opens the joint by a horseshoe incision, dividing the patellar ligament. The whole joint is inspected and gently mopped out with alcohol. The tourniquet is then removed, bleeding vessels tied, the surfaces of the joint smeared with bipp and the joint closed. The limb is fixed in extension with a 15-pound weight. Dressing is left on for three weeks. Movement and massage are commenced as soon as the wound is healed.

C. A. HEDBLÖM.

Short, A. R., Arkle, J. S., and King, G.: A Report on Wound Treatment by Brilliant Green Paste. *Brit. M. J.*, 1917, ii, 506.

Experience has abundantly proven that to secure efficient sterilization of an infected wound antiseptic remedies must be applied not occasionally but continuously. Carrel's technique needs much attention which cannot always be given when the patient is traveling and which may be impossible during "straffe" times. Bipp is much less troublesome but may be poisonous either from bismuth or iodoform or both. It may also delay healing and it leaves a residue in the tissue which on subsequent X-ray may be mistaken for a foreign body and lead to unnecessary operation.

Because of these objections to Carrel's solution and to bipp the authors have substituted a paste, introduced by Hey, consisting of brilliant green, boric acid, French chalk and liquid paraffin. They report results in a series of 60 cases and claim for it the following advantages:

1. It is non-poisonous. Boric acid poisoning should be watched for, but has not occurred in this series.

2. It is painless.

3. In the great majority of cases it almost completely sterilizes the wound in three days, so that secondary sutures can be performed even in large wounds complicated by bone injury. Small completely excised wounds can be primarily sutured.

4. The wound need be dressed but once in four days.

5. No permanent residue is left to interfere with immediate healing.

The wound must be thoroughly opened up and any foreign bodies removed before applying paste. If the patient has received too great a shock or if the wound is long, exposing important structures, Carrel's method is preferred. The usual procedure has been to stain the track with a 1:500 solution of brilliant green through a Carrel tube, to excise and paste it, inserting a few central sutures or leaving it open. If amiares taken from the deepest part of the wound on the third or fourth day show no bacillus perfringens and not more than six other organisms to the field, the wound is completely closed by secondary suture. Often the wound shows no organisms at all. The original pasting is not effective after three days.

Of the 60 reported cases so treated, 16 are considered remarkably successful in that the wounds were very extensive and in general were complicated by bone or joint injury. Forty-three are classified as successful in that they were less serious but gave perfectly satisfactory results. Of 10 relatively unsuccessful cases 4 were hopeless from the beginning, amputation being necessary in one and death supervening in three. One other died after the wound was clean. In the case of the remaining five the wounds were so deep that proper treatment by the method was not achieved.

C. A. HEDGECOCK.

Drummond, H., and McNee, J. W.: *The Treatment of a Series of Recently Inflicted War Wounds with Flavine*. *Lancet*, Lond., 1917, cxviii, 640.

It appears evident that flavine does not sterilize recent wounds, and that various bacteria grow freely in wounds treated with it. It appears to cause a very superficial necrosis and the formation of a fibrinous membrane, if applied in the strength of 1 to 1,000.

In spite of the presence of bacteria, there is a notable absence of inflammation and septic infections, and in cases observed there were no bad examples of gas gangrene, although anaerobic organisms were present in large numbers in many wounds. Healing by granulation is very slow and the growth of granulations is incidentally checked by the presence of flavine.

In the present series of operations it is clear that flavine does not bear out some of the claims made for it as a bactericidal agent or regarding its harmlessness to tissue cells. It appears to be useful when used as the first dressing to large open wounds, applied in the form of gauze soaked in solution, and it seems to limit the power for harm of the pathogenic bacteria and to prevent the inflammation of the tissues which is usually caused by bacterial invasion. Further observation in many more cases is necessary to establish its value in the treatment of recent wounds.

Almost all of the cases in which flavine was used were operated upon and the treatment with flavine commenced within twelve hours of the injury. In many instances only four or five hours had elapsed before the wounds were dealt with. All of the wounds were therefore in the presuppurative stage.

The flavine was at first employed in a strength of 1 to 1,000, which was used only for the first dressing. 1 to 5,000 dilutions were used for subsequent dressings. Where the Carrel method of irrigation was used, 1 to 10,000 was the dilution.

In the last 30 cases comprising over 120 wounds were treated. The vast majority of wounds were caused by fragments of shells or bombs. The wounds may be divided into three classes: (1) flesh wounds; (2) compound fractures; (3) miscellaneous wounds of the abdomen, chest, head, and joints.

Long incisions with free excision of damaged muscle and fascia must be regarded as a cardinal part of all operative treatment in recent wounds. After this preliminary surgical treatment, the wounds treated with flavine were dealt with in the following ways:

1. Primary suture. This method was employed in 30 cases, all being wounds of soft parts alone. In the majority of these the damaged muscle removed at operation and examined bacteriologically was shown to be infected. Fragments of dirt and cloth were frequently removed from the track of the wound.

2. Drainage by tube or gauze strip, followed by secondary suture; employed in 10 cases.

3. The Carrel method of intermittent irrigation. The wounds were irrigated every 4 to 6 hours. This method was chiefly employed in compound fractures and deep or extensive muscle injuries.

4. Gauze packing in open wounds, such as certain types of compound fracture and amputation of stumps where complete closure was impossible. The gauze packing soaked in flavine could be left *in situ* for several days without changing the dressing.

Wounds treated by excision of the infected and damaged tissue, followed by primary suture, gave excellent results. In a series of 30 wounds only two broke down.

The cases treated by drainage with a secondary suture gave good results in all the 10 cases in which it was adopted. In several instances secondary suture was done before the wound was bacteriologically sterile, but no untoward results followed. Healing in cases of secondary suture was slower than in primary suture.

Open wounds treated with flavine either by the Carrel method or gauze soaked in flavine were carefully followed. The typical progress of such a wound may be outlined. On removal of the first dressing on the third day, the wound, except for being deeply stained with flavine, has undergone no alteration in appearance and resembles an injury only a few hours old. All signs of inflammation are wanting and there is no pain, redness, swelling or induration in the tissues. The secretion is minimal in amount

and suppuration is absent. The absence of suppuration even where films show abundant organisms is noteworthy. When dressed again at the end of a week the skin edges are clean cut, no epithelial growth having taken place from the edges. The floor of the wound has become covered by a closely adherent membrane forming over whatever tissue is exposed in the wound. The wound from this time on, if flavine is continued, remains in a dried-up state showing neither signs of inflammation nor repair.

Experience has shown that a wound heals with much greater rapidity if the use of flavine be stopped after three or four days in the case of small wounds and after about a week in severe wounds or compound fractures. If at this period eusol is substituted, the yellow membrane comes away piecemeal within a day or two and granulations appear more luxuriantly. In a few days growth of epithelium is well established at the edges of the wound and abundant purulent discharge appears with the occurrence of rapid healing.

Regarding the treatment of wounds of the chest and abdomen it is of interest that considerable quantities of flavine can be left in the abdominal and thoracic cavities without inducing the least toxic effect.

Portions of tissue have been removed from the edges or floor of seven open wounds under treatment with flavine and examined histologically. These examinations were made two, two and one-half, three, eight, eight and eleven days after treatment had begun. Up to three days the skin edges were sharply cut and unaltered histologically. The floor of the wounds showed a thin layer of fibrin and polymorphonuclear leucocytes, covering a narrow zone of neurosed muscle fibres. Between the dead fibers polymorphonuclear leucocytes were fairly abundant and in one case many large gram-positive bacilli of the usual anaerobic type were present.

The material taken from a wound on the fifth day showed a thicker covering of fibrin and leucocytes, with a few dead muscle fibers imbedded in it. No evidence of granulation tissue production was observed and the skin at the edge showed no epithelial proliferation. The wounds in two cases on the eighth day were in a dried-up condition and to the naked eye showed no sign of inflammation or repair. Microscopically there was a minimal amount of epithelial proliferation from the skin edge. The floor of the wounds was covered by the membrane of fibrin and leucocytes. Below the membrane in one wound granulation tissue production was evident throughout. The tissue taken on the eleventh day showed no new features, granulation tissue production being well established below the membrane, but there was very little epithelial growth from the skin edges.

Bacteriologically, a small number of wounds remained sterile from the outset, but in the majority of the wounds no sterilization was brought about by the application of flavine. Infection by anaerobic

bacilli was very common in the early stages, but tended to pass off at the end of about a week except in the cases of compound fracture. After a few days the invasion of the wounds by streptococci was almost the rule, accompanying or replacing the anaerobic infection. After a week or longer, infection with a variety of other organisms was commonly met with, especially staphylococcus and bacillus pyocyaneus. The conclusion was reached that the type of infection in wounds treated with flavine in no way differed from that met with in cases where other treatment had been employed.

Test tube experiments with flavine and various organisms were made with the following results:

With staphylococcus aureus, no living organisms were found in a tube containing 1 to 10,000 flavine.

With streptococcus pyogenes, no living organisms were found in a tube containing 1 to 100,000 flavine.

With streptococcus faecalis, no living organisms were found in a tube containing 1 to 50,000 flavine.

With bacillus perfringens, no living organisms were found in a tube containing 1 to 100,000 flavine.

With coliform bacillus, a living organism was recovered from a tube containing 1 to 100 flavine.

A second series of tests, in which the dilutions of flavine were made in fresh human serum, were carried out with coliform bacillus, with the result that no living organisms were recovered in subculture from the dilution of 1 to 8,000 in serum.

A further test to show whether or not the enhancing power of serum on flavine was lasting showed that in a dilution of 1 in 5,000 flavine no growth was obtained at the end of 90 hours, the mixture of serum and flavine retaining its antiseptic power for at least that length of time.

The author's conclusions are:

1. Flavine has the following advantages in the treatment of recent wounds: (a) there is an absence of all toxicity; (b) it prevents suppuration and spreading sepsis, (c) the primary dressing need not be changed for two or three days; (d) the wounds are not inflamed or painful and the surrounding skin is never irritated.

2. Excision of damaged tissue and mechanical cleaning of the wounds are necessary preliminaries to the use of flavine.

3. Flavine cannot be classed as a success in the treatment of the later stages of war wounds. The wounds tend to assume a stagnant condition, during which time the processes of repair are in abeyance.

4. In the majority of cases war wounds are not rendered bacteriologically sterile by the prolonged use of flavine.

5. Test tube experiments carried out with organisms isolated from actual wounds bear out the strong antiseptic properties of flavine, and their enhancement in the presence of serum. V. C. HUNT.

Rowe, R. M.: A Note on the Carrel-Dakin-Daufresne Treatment. *Brit. M. J.*, 1917, 0, 187.

The author reports the results of six months' experience of the Carrel-Dakin-Daufresne treatment

in infected wounds in a general hospital of the British expeditionary forces, carried out strictly in accordance with the system employed by Carrel at his hospital. They report:

1. Absence of secondary hemorrhage.
2. Absence of amputations except in infected and badly comminuted knee-joints and badly comminuted ankle-joints.
3. One case of septicæmia.
4. A mortality of one; this was a very dirty comminuted knee-joint.

The cases have, in general, required a longer period of treatment than is the rule at Carrel's hospital. This is attributed to the later stage at which British cases come under treatment. Five days appears to be the shortest period of disinfection.

C. A. HEDBLUM

Fleming, J. S.: An Albuminate of Copper as an Intravenous Antiseptic. *South. M. J.*, 1917, 2, 845.

The compound is made up by complete precipitation of copper sulphate in human blood serum. This precipitate is thoroughly washed and spread thinly and evenly upon large surface receptacles and evaporated to dryness, after which it is ground to a powder in a sterile mortar. One gram of this powder is accurately weighed out and added to 100 ccm. of physiologic salt solution and sufficient 15 per cent caustic soda to make it strongly alkaline, approximately 5 to 10 drops. When the solution is complete, a sufficient amount of 5 per cent solution of hydrochloric acid is added drop by drop to render the reaction of the solution faintly alkaline. It is filtered through sterile cotton, warmed, and put into a salvarsan outfit.

The action on typhoid bacilli was determined experimentally showing the copper, 1 per cent solution, inhibits the growth within twenty minutes and prevents growth of the organisms in half an hour.

A solution was then made up with guinea pig serum; intracardiac injections of 1 ccm. of a 1 per cent solution were made in these animals every four days, with only a slight reaction.

The human experiments were carried out on cases of advanced tuberculosis. No results of note were derived. It appears to have no influence upon typhoid fever.

CARL R. STEINKE.

Fowler, W. F.: An Evaluation of Asepsis and Antiseptics. *Ann. Surg.*, Phila., 1917, lxxv, 535.

The author gives an extensive account of the work of many investigators in aseptic and antiseptic surgery.

Under normal conditions the steam sterilizer is dependable. The method of preparation of catgut is a safe one. Preservation of the normal resistive and recuperative powers of the tissues is an important measure. Gentleness must be cultivated. The author does not believe that the gloved hand should

be kept out of the incision, as he claims that this is just as sterile and less traumatizing than instruments. The skin edges should be walled off with towels.

Analysis of the several investigations herein quoted is extremely instructive. For example:

Whiting and Slocum state that alcohol, 40 to 65 per cent, will kill the bacillus typhosus in practically the same time as various coal-tar derivatives in alcoholic solutions of from 60 to 65 per cent. Nevertheless, they consider the phenols to be more efficient germicides.

Post and Nicoll learned that mercuric chloride has very little germicidal action in aqueous solutions.

Whiting believes that alcoholic solutions of mercuric chloride are much more efficient, especially on dry skin.

Grossich emphasizes the importance of using alcoholic solutions of iodine on a dry skin.

Of alcohol Whiting says: "As a solvent or vehicle for the various antiseptics used on the skin, it is vastly superior to water, the alcoholic solutions penetrating more deeply and having greater germicidal power than the aqueous."

Keilty and Packer conclude that alcohol is practically inactive as a germicide.

Post and Nicoll rank alcohol, in solutions of more than 50 per cent, as one of the most active germicides. Some investigators have underestimated the germicidal power of alcohol.

Bovee's tests of the skin, leaving the iodine on it, gave negative cultures fifteen days after operation.

Robb believes that the action of iodine is merely inhibitory and he fears peritoneal invasion by un-killed germs during operation.

Robb and Whiting both obtained sterile cultures before neutralization of the antiseptic, but a large percentage of growths occurred after neutralization.

Post and Nicoll also consider tests of doubtful value unless the action of the antiseptic is stopped forthwith.

Clinically, iodine is allowed to remain on the skin. It penetrates into the deeper layers, and there are no means of determining how long its activity may continue. The consensus of opinion classes iodine as an effective germicide. Granting that its action may be delayed, or that perfect asepsis of the skin is unattainable, or assuming, with Robb, that iodine merely inhibits germ life, nevertheless, the tissues, including the peritoneum, can defend themselves against limited numbers of bacteria.

Morris enumerates the disadvantages of rubber gloves. The fact that hand sterilization is so difficult and glove sterilization so easy would seem to outweigh the objections to the use of the latter.

Seelig and Gould are convinced that laboratory tests which do not simulate clinical conditions are of little value; that alcohol in solutions of 50 per cent or more is strongly germicidal but less so than iodine, that a solution of alcohol and iodine together is more germicidal than either alone, that alcohol, carbolic acid, and iodine can penetrate

animal membranes, and that penetration is facilitated by the presence of oil in the skin.

Lambert has shown that iodine alone, of various tested antiseptics, will kill bacteria rather than tissue cells. Although the phenols have decided germicidal power and possess the ability of penetrating animal membranes, they are, unfortunately, tissue destroyers. Clinically, alcohol is non-irritating.

Brewer demonstrated that infection may be due to minor lapses in technique, to germ-bearing suture material, to contaminated novocaine solution, or to failure of the steam sterilizer. It is not safe to assume that any link in the chain of technique is unbreakable.

The conclusions are as follows:

1. Abundant clinical evidence of the efficacy of iodine in skin sterilization has been corroborated by laboratory findings.

2. The germicidal action of mercuric chloride is too slow to be of value in sterilization of the skin.

3. Eternal vigilance is the price of asepsis.

C. A. BOWERS.

ANÆSTHETICS

Graham, E. A.: Toxic Factors of Some of the Common Anæsthetic Substances. *J. Am. M. Ass.*, 1917, lxi, 1666.

A consideration of the possible toxic factors of the anæsthetic agents is important in serving to prepare the way for the avoidance of disasters, and in insuring a greater margin of safety to the patient who undergoes an operation.

Narcosis is always accompanied by a condition of diminished oxidation. It therefore always indicates a condition of more or less severe asphyxia of the tissues. Loeb has shown that an asphyxiated tissue always becomes acid. It is not surprising, therefore, that surgical anæsthesia induces many of the signs of an acid intoxication. As is well known, also, an existing acidosis is aggravated by a surgical anæsthesia.

The power of the common anæsthetics to induce severe toxic effects varies. Ether causes these changes much less readily than does chloroform; and nitrous oxide has only a slight tendency to induce them. The increased toxicity of chloroform over ether and nitrous oxide is probably to be found in the fact that during the breakdown of chloroform in the body hydrochloric acid is formed. Therefore chloroform, in addition to giving rise to an acidosis as a result of the narcosis asphyxia, actually yields a strong inorganic acid as well. The changes in the tissues characteristic of late chloroform poisoning, such as oedema, hæmorrhages, fatty changes and central necrosis of the liver, are probably really the effects of hydrochloric acid.

The common anæsthetic substances are capable of dissociating in a manner which yields bivalent, or unsaturated, carbon. The toxicity of the cyanides and carbon monoxide probably depends largely on

their property of dissociating in a similar manner. It is therefore probable that some of the effects of the anæsthetic substances are due to their unsaturated residues.

ALBERT EHRENFRIED.

Henderson, E. L.: Nitrous Oxide-Oxygen Anæsthesia in General Surgery. *Am. J. Surg.*, 1917, xxxi, 291.

The experiences of the author lead him to assert that there are few contra-indications to the employment of nitrous oxide-oxygen in general surgery; regardless of the length of its administration, the previous mental and physical status of the patient is restored within a few minutes after withdrawal. Furthermore, when administered by an expert, nitrous oxide-oxygen, he believes, has practically no limitation as a general anæsthetic; it is also the most desirable and the safest of general anæsthetics.

In the administration of gas, it is of the utmost importance to guard against cyanosis and respiratory difficulty by careful regulation of the administration of the gas and oxygen, especially during prolonged administration. This anæsthetic is contra-indicated in children under five years of age, because of the small size of the respiratory passages and increased liability to asphyxial symptoms; for the same reasons, it should not be employed in enlarged tonsils, cellulitis, tumor of the neck, or in other respiratory obstructions. It is also contra-indicated in serious cardiac lesions with broken compensation, aneurism, and in emphysema and marked arterial sclerosis. In the aged, intolerance in asphyxia and circulatory stress is likewise a feature to be remembered, especially if chronic bronchitis is present. Nitrous oxide-oxygen is not contra-indicated by old age itself.

Preliminary to the administration of nitrous oxide-oxygen in general surgery, Henderson has been accustomed to give the patient one hypodermic of atropin sulphate, 1:200 to 1:150 gr., but where there is no contra-indication he gives morphine, 1:8 to 1:4 gr. For the induction of surgical anæsthesia, he now prefers the so-called "safety apparatus," manufactured in Chicago.

E. C. ROBITSHEK.

Large, S. H.: The Use of Nitrous Oxide and Oxygen Analgesia in Operations on the Ear, Nose, and Throat. *Cleveland M. J.*, 1917, xvi, 725.

Large describes his technique, based upon an experience of over a year.

Adrenalin and cocaine are used, locally or by injection. Ten minutes should elapse before beginning the operation, which should be performed in the reclining position. The patient is carried into complete anæsthesia by the nitrous oxide and oxygen, using a face mask. The mask is then removed and a mouthpiece inserted into the side of the mouth. Should the patient be very nervous, he prefers to use a soft rubber catheter through one side of the nose, keeping the mouth closed by rubber dam. When using the mouthpiece pledgets of cotton are placed in either side of the nose, well

back, to economize the gas and to catch the blood before it drops into the nasopharynx. In using the mouthpiece very little oxygen is needed, as the patient naturally gets sufficient air.

The machine is equipped with a three-way valve, so as to obviate the necessity of changing attachments. When operating within the mouth, it is necessary to use a nasal mask. ALBERT EHRENFRIED.

Burger, T. O.: Practical Local Anesthesia. Am. J. Surg., 1917, XXII, 289.

In all of his cases the author uses local anesthesia, and gives morphine, one-sixth to one-fourth of a grain, and scopolamine, 1:150 to 1:200 of a grain, one hour before starting to operate. In the use of local anesthesia, a knowledge of anatomy and of the nerve supply, and of the structures which require better infiltration, are essential.

The patient should be made perfectly comfortable on the table. The piston of the syringe is kept moving, and the solution is made to slowly precede the needle point; sharp cutting instruments are absolutely necessary.

Burger believes that novocaine is the ideal non-toxic drug for this purpose. He uses a solution of one-half per cent novocaine, plus 8 minims of a fresh 1:1,000 solution of adrenalin to the ounce.

The author has used local anesthesia to the entire satisfaction of himself and his patients in practically all of his hernia work, and also has had most satisfactory results in hemorrhoid work. He has found that local anesthesia can be used effectively in vaginal plastic surgery, excepting perineorrhaphy.

In summarizing, the author says that local anesthesia is adaptable to most surgery, but lends itself best to certain operations and to certain individuals, and it should be used with these points well considered. Proper instruments, perfect knowledge of anatomy, preliminary hypnotic gentleness, self confidence and the confidence of the patient, are all essential features. E. C. ROBITNIK.

SURGICAL INSTRUMENTS AND APPARATUS

Monprofit: Modern Instruments for Limb Amputations (*Instrumentation moderne pour les amputations. Arch. de méd. et pharm. mil., Par., 1916, LV, 161.*)

In 1908 Monprofit exhibited before the *Société de Chirurgie* of Paris an entirely metallic hemostatic binder which was destined to replace the Esmarch hemostatic band. This latter apparatus which otherwise had great utility had the disadvantages that it was fragile and that it was difficult to sterilize.

The metallic appliance of Monprofit is illustrated and described. It is easily applied and sterilized with the greatest facility. It is in every way superior to the rubber band. This appliance has been used both in the Balkan war and the present war by Monprofit and other surgeons with great success.

Monprofit has also for the past fifteen years been occupied with designing metallic retractors for use in amputations. His first metallic retractors were described in 1904, and these as well as his latest models for different limbs and positions are described.

A historic sketch of the evolution of amputation retractors is given by the author, including Gooch (1730) who replaced the canvas compress by a leather band which was improved by Bromfield (1773). Bell's metallic retractors, an important innovation in surgical instrumentation, were in use in 1796. Percy's improvement on Bell's instrument was probably constructed about 1799, as it is described in literature immediately after this.

For reasons which Monprofit states, metallic amputation retractors fell into disuse until their importance was again brought forward by him in 1904. His present retractors are only an adaptation of the neglected instrument of Percy.

W. A. BRENNAN.

SURGERY OF THE HEAD AND NECK

HEAD

Anton and Schmieden: Suboccipital Puncture. Munchen. med. Wochenschr., 1917, No. 6.

In January 1917, the authors reported suboccipital puncture as an operation for diminishing encephalic compression. The puncture of the corpus callosum showed a favorable and lasting action in endocranial compression and the cerebral circulation, and obviated consecutive cerebral lesions. Some cases of epilepsy also were treated in this way.

Recently the indications were very much widened by Perry who adopted the operation at the war front 30 times with good results in cranial con-

sions, traumatic encephalic tumefactions and in traumatic meningitis.

Discussing certain aspects of the procedure the authors think it is logical to open the atlanto-occipital membrane in order to obtain a permanent reduction of pressure, and to keep it open. Good reasons based on physiological researches indicate the identity of the cerebral and spinal fluids. Druif demonstrated that in animals after the ablation of the membrane, even strong increases of pressure could not kill the animals as long as the membrane remained patent.

The authors describe the technique of suboccipital puncture in detail. It is practiced in the nuchal

region under local anæsthesia. An incision about 8 cm. long is made, commencing about two finger-widths under the external occipital protuberance and terminating below the spiny apophysis of the seventh cervical vertebra. The atlanto-occipital membrane when met is slightly elastic, but when the pressure is augmented it is convex, and after a slight puncture the fluid issues in a jet. By inserting a blunt sound the cistern at the base of the cerebellum is reached and eventually the fourth ventricle. The opening made should be kept open, leaving a fistula of cerebrospinal fluid in the intramuscular or subcutaneous tissues. The rest can be sutured.

The suboccipital puncture has been applied in some desperate cases of severe cerebral tumor with improvement of the symptoms. The authors think that the operation may justly be employed in slightly encephalic morbid conditions, such as hydrocephalus, serous meningitis, epilepsy with status epilepticus, or even in severe hemiparesis with Quincke's oedema. As regards its influence in the psychoses preliminary studies are not yet complete.

W. A. BRENNAN.

Duval, P.: The Treatment of War Wounds of the Soft Parts (Note sur le traitement des plaies de guerre des parties molles). *Bull. et mém. Soc. de chir., de Par.*, 1917, xliii, 1739.

Duval in the army service to which he was attached created a special organization to deal with wounds of the soft parts. These are the most numerous in war and when favorably treated heal quickly and well, but under unfavorable conditions may result disastrously. It is an accepted principle that injuries of soft parts exposed to contamination should be operated upon at once, excised, and cleared of foreign substances. Immediate suture is then the procedure of choice, but this under the conditions is not always realizable and is done only exceptionally.

Duval has created at as advanced points as permissible to the firing line some surgical units equipped for operations and reserved for special treatment of soft part wounds. About one-third of the cases were destined for primary suture. The other two-thirds had their injuries surgically cleaned and were immediately evacuated to the territorial hospitals. Of those primarily sutured only about 4 per cent were failures. Of the two-thirds having an early complete surgical cleansing operation, 81 per cent were sutured on an average about eleven days after operation. In these cases there were no deaths and no cases of tetanus. Eighty-four per cent of the evacuated were sutured and completely cured five weeks after injury.

The author thinks that it is hardly a matter of regret that primary suture, although the procedure of choice, cannot under the conditions of an offensive be practiced, as the secondary suture after surgical disinfection gives almost equally good results. After this first operation and evacuation the wound

was merely kept covered with a simple aseptic dressing. The Carrel method of disinfection was only necessary in about one-tenth of these cases.

Duval thinks that the progressive systematic sterilization of surgical wounds is a method which facts demonstrate to be useless in about two-thirds of the cases, and that delayed primary suture takes precedence over secondary suture as it notably reduces the time of treatment and gives better recovery.

W. A. BRENNAN.

Sicard, J. A.: Treatment of True Facial Neuralgia by Local Injections of Alcohol (Traitement de la névralgie faciale essentielle par l'alcoolisation locale). *Presse méd.*, Par., 1917, p. 620.

In trigeminal neuralgia, Sicard states, the destruction of the nerve branches by chemical solutions, especially alcohol, has effectively replaced physiotherapeutic and surgical treatment. The only surgical treatment which is definitely curative, i.e., the removal of the gasserian ganglion, is accompanied by many dangers. Sicard has experimented with several neurolytic agents, but has abandoned all in favor of alcohol. This is used in strength of 70 to 95 per cent according to the age of the patient and the condition of the tissues.

There are three stages of neurolysis: the superficial, the medium, and the deep. The superficial stage includes the ophthalmic nerve at its bony supra-orbital emergence; the medium stage includes Spix's spine and the posterior palatine canal; the deep stage includes the sphenoidal orifice, the superior and the inferior maxillary nerves.

In the technique it is necessary to know precisely how to place the needle in the bony facial structure, and for this the operator must become expert by practicing injections on the cadaver, before injecting the living patient. Such injections must be made under local anæsthesia.

The dosage of alcohol to be injected in each canal or orifice ought not exceed 1.5 ccm. For a neuralgia involving all three branches of the trigeminal nerve at the first treatment the superficial regions of the ophthalmic, suborbital and inferior dental may be injected and in a second treatment made two or four days later the deeper regions can be injected.

In making the neurolytic injections pain is never completely avoided. Care must be taken to avoid injecting a vessel; ocular paralysis may occur from involvement of the external ocular motor nerve. Facial paralysis or facial erysipelas may occur, but this is extremely rare.

In order to insure success it is necessary that the neuralgia should be true facial neuralgia. Secondary facial neuralgia of exo- or endocranial origin is not relieved by alcohol injections. It is also necessary that the nerve branches responsible should be immediately reached by the injection, and the immediate anæsthesia of the cutaneous or mucous territory dependent on the injected nerve is the proof that the injection has succeeded. Success is always assured if the alcohol has been able chemical-

ly to section the responsible branches or nerve-trunks by determining a consecutive and lasting anesthesia of the corresponding skin and mucosa.

W. A. BRENNAN.

Parker, W. R.: Total Loss of Vision in One Eye and Partial Loss in the Other Completely Relieved by a Sellar Decompression Operation. *Arch. Ophth.*, 1917, lvi, 328.

The case reported is that of a man of thirty-three with complete loss of vision in the right eye during the course of a year and partial loss in the left, with pain over the right eye radiating to the right mastoid region and occiput.

Both eye and general examination showed nothing distinctive, but X-ray plates disclosed an enlargement of the sella with absorption of the posterior clinoid processes, especially in the middle portion, so that the tips looked like isolated pieces of bone. Diagnosis of the tumor in the region of the pituitary body was made and a sellar decompression operation was done with removal of a portion of the pituitary struma.

Five days later vision began to return and on the eleventh day central vision in both eyes was normal.

S. S. HOWE.

Kearney, J. A.: The Value of Eye-Ground Observations in Recent Cases of Fracture of the Skull. *J. Am. M. Ass.*, 1917, liii, 1399.

While X-ray examination of a fractured skull is important, it reveals very little concerning high intracranial pressure, relief of which is imperative.

Recent cases in the first 24 hours usually show a general edema blurring equally all details in the fundus of the eye; this blurring is either slight or obscures all usual landmarks, the venous twigs if visible being dilated out of proportion to the size of the arteries. When uncomplicated by increased intracranial pressure, this retinal edema gradually subsides.

Later the edema may increase, or in addition to the previous edema there may be an added obscuration of the nasal half of the disk and its margins; these changes are early indications of increase in intracranial pressure, confirmation of which can be had by measuring the pressure of the cerebrospinal fluid at lumbar puncture by a spinal mercurial manometer. All such observations have shown increase in pressure. Occasionally the edema may occupy the entire disk, a papilloedema.

Conclusions as to treatment, based upon the observation of 212 cases, are as follows:

All fractured skull cases should be placed in bed, with an ice helmet to the head, absolute quiet maintained, free catharsis established and the patient given a liquid diet.

If intracranial pressure is increased slightly and up to double the normal, repeated lumbar puncture is indicated.

If the intracranial pressure is doubled or more, and the pulse-rate is somewhat lowered, simple cranial decompression is indicated for relief of the pressure and for drainage before collapse of the medulla.

Examination of the fundus 24 hours after decompression or spinal puncture generally reveals a reduction in the edema. H. J. VAN DEN BERG.

Pemlster, D. B.: Brain Cyst Following Skull Fracture. *Surg. Clin. Chicago*, 1917, I, 971.

The patient, aged 12, was admitted to the hospital because of attacks of epilepsy which had occurred during the past four months. He was a normal, healthy child until four and a half years previous, when he was struck on the left side of the head above and back of the ear by a pole from a hay-wagon. The blow rendered him unconscious and produced a compound fracture of the skull from which some brain tissue escaped at the time. Consciousness was gradually regained after forty-eight hours, and the wound healed promptly with little infection. No paralysis, disturbances in speech or other focal symptoms were noticed during his convalescence. During the past year he had had repeated attacks of headache, usually in the occipital region, lasting for a few hours, but not accompanied by nausea or vomiting.

He answered questions intelligently and showed no defects in speech or motion. There was a scar and a moderate uneven depression about one and one-half inches long over the left parieto-occipital region, extending downward almost to the left mastoid. It was 1 1/4 cm. wide above and 1 cm. wide below. Palpation revealed the absence of bone over a portion of the depression and pulsation could be seen and felt.

The X-ray picture of the head showed an elliptic defect of the skull about one and one-half inches long, extending upward and slightly backward from the top of the left mastoid. There were no fragments of bone within the brain substance.

A diagnosis of traumatic epilepsy was made, but the exact nature of the changes within the cranial cavity was not predicted.

At operation, two days after admission, a horse-shoe-shaped flap, with its base on the level of the upper limits of the mastoid, was turned down from the parieto-occipital region, the anterior margin of the bone-flap bordering on the linear defect in the skull. A large cyst could be seen and felt in the anterior portion of the exposed area and in the region of the defect in the skull where the dura mater was irregularly thickened and scarred. The cyst was opened in this region and about 200 ccm. of a clear colorless fluid escaped. The space was packed with a one-inch plain gauze strip. It was removed gradually, beginning on the third and ending on the ninth day after operation, when a gauze strip was inserted. There was a profuse discharge of a slightly blood-stained serous fluid during the first ten days, after which it gradually decreased and ceased soon

after the removal of the gauze drain on the twentieth day.

The patient had a very interesting postoperative course. The temperature fluctuated between normal and 104°F. During the first four days after operation he was comfortable, rational, and had no headaches. On the fifth day the right hand became numb, and he complained of dizziness, but there were no twitchings or loss of consciousness. During the next two weeks his mental condition remained fairly good. Then he gradually became dull and irritable, crying out at frequent intervals. The right side of the body began to show signs of paresis, and this condition increased until it was very marked, especially in the arm and leg. The mental confusion gradually increased. There was well-marked sensory aphasia.

The patient left the hospital unimproved. Stupor became more marked and he died six weeks after operation. No autopsy was obtained, but death was probably due either to infection of the brain tissue without any definite signs in the external wound, or to the marked cerebral injury caused by the shifting of the brain substance in the filling out of the cyst cavity.

EDWARD L. CORNELL.

Brown, R. C.: The Repair of Skull Defects. *Med. J. Austral.*, 1917, ii, 409.

The symptoms occurring in the author's experience as results of defects in the skull following injury, are: first, attacks of dizziness, especially on exertion; second, fear of pressure or a blow on the weak part; third, headaches and head pains; fourth, appearance of dullness and apathy; fifth, weakness of memory; sixth, objection to the deformity caused by the pulsating deep depression in the scalp.

An ideal operation should aim at restoration of the brain with a filling of the gap by bone, attempting not only to secure a corrective effect but also to restore the patient's confidence in the permanent reliability of this part of the skull, and to make the external surface of the original shape, strength, and rigidity. Among the procedures advocated thus far, the insertion of foreign substitutes such as silver plates, celluloid, etc., and fascia lata and autogenous cartilage grafts have been suggested. Autoplastic bone grafts in the author's opinion must be used to give the best and most permanent result. The best fields from which to remove grafts are the tibia and the ribs. He believes that the ribs are better adapted to this because they are easily approachable, and either naturally conform to the outlines of the skull or can readily be made to do so. The required instruments are of the simplest, and the graft after several months appears to be a part of the skull itself. In the earlier operations the entire thickness of the rib was used, but he now uses only the outer half. He prefers rectal anesthesia.

The skull edge is freed from the cicatrix and underlying dura with the engine and curved elevator, and the bone edges are refreshed for a distance of one-half

an inch all around. A free incision is made over the sixth or seventh rib, muscle attachments separated, and periosteum left. The rib is then split on the flat to the required extent, removing the outer table with periosteum and cancellous tissue intact. This rib splitting is done with a thin, sharp carpenter's chisel three-fourths of an inch wide, with the edge ground to a semicircular shape. The graft can be bent to any shape and if more than one graft is used the adjacent edges are freshened with scissors. The ends of the graft are placed beneath the pericranium which is sutured to the graft. Then a couple of catgut sutures are placed transversely across the graft. The scalp is replaced, allowing free drainage for twenty-four hours on account of the risk of a hematoma.

The author states that one cannot appreciate the advantages of the rib in skull work until one has used the tibia as a field of graft supply. Vertigo is the symptom most constantly relieved. In all of his later cases in which he used the split rib the outline has been almost perfect, in marked contrast to the flat appearance of the tibia graft. He has performed this operation in 13 or 14 cases with great success.

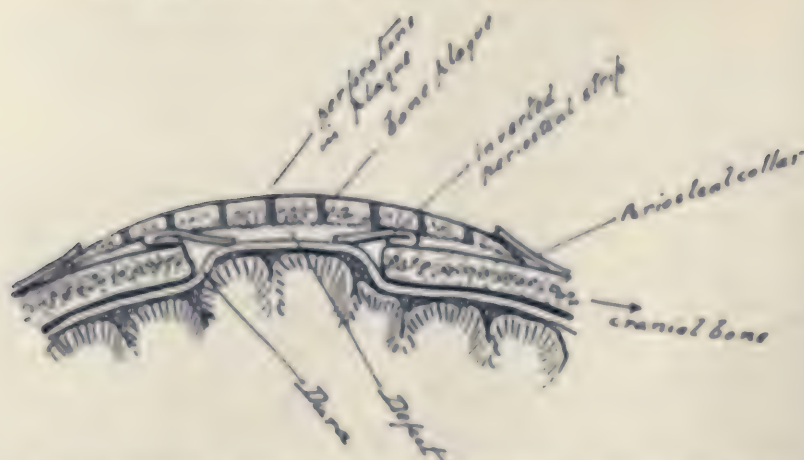
D. N. EISENDRATH.

Sicard, I., Dambrin, C., and Roger, H.: Osteogenic Action of Sterilized Bone Plate in Cranial Prosthetics (Action ostéogénétique de la plaque osseuse stérilisée dans les plasties crâniennes). *Presse méd.*, Par., 1917, p. 577.

In 1916 the authors proposed a new method of cranial plastics by the use of sterilized cranial bone plates for the repair of cranial defects. In some of their earlier operations a few failures resulted due rather to fault of technique than to the method. The authors have now greatly improved the technique and in 43 operations have had no failures.

The cranial defect to be repaired is regularized if it is of a very irregular shape. The bone plate to be used is taken from the homologous cranial region of an autopsy case. It is boiled for a few hours in water to which a handful of sodium carbonate is added. It is trimmed so that it is in diameter about 0.5 cm. larger than the hole to be covered. It is thinned at the edges and scraped away until the spongy diploe is freely apparent. When this condition is reached the plate has a thickness of from 1 to 2 mm. The entire surface is pierced with small holes about 0.5 cm. distant from each other. It is well even to prepare a few such plates so that the surgeon may select that one which is best adapted to the breach in the skull.

The plate is next thoroughly sterilized, both chemically and by heat. It is first placed in ether for forty-eight hours, then in a mixture of equal parts of ether, alcohol and pure formol for twenty-four hours; then it is washed in boiling water and submitted to vapor sterilization in an autoclave at 110° for half an hour. Finally the plate is tested for growth in bouillon and if the liquid remains sterile the plate is surgically ready.



Schematic drawing showing arrangement of bone plate. (Sicard, Dambrin, and Roger.)

The edges of the cranial breach are then freshened. The periosteum is incised down to the bone at a distance of about 1 cm. from the periphery of the defect, and it is stripped away at each side of this incision so that there are two periosteal strips. The first of these strips which is adherent to the edge of the breach is turned back on itself and pressed down on the dura mater so that its under surface becomes the upper surface, this upper surface being destined to come in direct contact with the bone plate. The plate is then deftly inserted under the edge of the outer periosteal strip like a watch glass in its rim and so that the periosteal strip forms a collar all around the plate.

By study of three of the early cases in which a secondary intervention was necessary the authors have been able to observe the osteogenetic process which occurs and how it is effected. It is found that a fibroperiosteal membrane forms which is adherent to the dura mater and thickly studded with little points having the consistency of bone. It is easily seen that the strip of periosteum which was turned over and pressed down on the dura mater is the point of origin of osteogenetic activity.

Examination of the under surface of an extracted bone plate shows that it is deeply pitted in certain places. The periosteal strip has borrowed from the dead bone those elements which have served to build up new osseous tissue destined to fill the defect from the periphery toward the center. The process is particularly marked in the holes drilled in the plate which become filled with the neoformation and act as rivets. Without the presence of the dead bone of the prosthetic plate, the periosteum probably would be deprived of any osteogenetic function. The lime salts placed in contact with the periosteum stimulate it and nourish its property of creating bone tissue.

In order that the osteogenetic function may reach its maximum it is necessary: (1) that the periosteal

strip should be pediculated; (2) that its internal nourishing face should be in direct contact with the bone plate; (3) that the bone plate tissue should be of relatively easy attack, presenting preferably a spongy character. The ordinary smooth surface of bone does not conduce to the transfer of the lime salts.

The authors think therefore by virtue of these findings and the results which they have obtained that bone cranial plastics have incontestable advantages over other procedures, and that such may even be efficaciously used to repair bone losses in other regions, where the osteogenetic activity of periosteum can be utilized.

The accompanying schematic figure shows the arrangement of the plate and periosteal strips.

W. A. BRENNAN.

Bacigalupo, J.: Tuberculomata of the Dura Mater (Tuberculomas de la dura madre). *Semana med.*, Buenos Aires, 1917, xxiv, 397.

Bacigalupo describes a case of two tuberculomata of the dura mater in a child. One of these, the size of a walnut, was in the left parietal region. Its base was adherent to the meningeal membrane. The other was on the right side, on the flank of the superior longitudinal sinus, equally on the parietal. It was about a centimeter in diameter and semi-spherical.

The child died of generalized miliary tuberculosis; the tumors were found at autopsy, and proved histologically. Such tumors are rare.

W. A. BRENNAN.

Kitchen, A. S.: Two Cases of Cerebellar Cyst. *J. Mich. St. M. Soc.*, 1917, xvi, 431.

The author reports two cases of cerebellar cyst, one in a man of thirty following trauma, another in a girl of fourteen without evident cause.

In the first case, the cyst was opened and lightly packed. A surprisingly rapid alleviation of symptoms followed. The cyst refilled and was aspirated two years afterward, then one year later. Several months ago the cyst was opened and drained, and the patient at present is well.

The second case had a simple cerebellar decompression done by another surgeon. About a month later the patient showed no improvement. The author enlarged the decompression, located, opened, and drained a cyst. At the present time, more than two years since the operation, the patient is well except for slight strabismus of one eye and unsteadiness on one foot.

Kitchen considers the various symptoms of cerebellar cyst, including an account of disturbance of various cranial nerves. TORR HARMER.

Abalos, J. B.: A Cyst of the Cerebellar Fossa (Quiste de la fosa cerebelosa). *Rev. méd. d. Rosario*, 1917, vii, 346.

A woman of 28 experienced symptoms of headache, vertigo, vomiting and prostration which persisted and increased. The case was finally diagnosed as encysted meningitis in the left half of the cerebellar fossa. At operation an osteocutaneous flap disclosed the fossa. The dura on the left side was opened after a previous puncture which was negative. The cerebral substance protruded through the opening. Punctures were repeated but were still negative. Exploration was then made with the finger. The cerebellar surface was soft on its convex face. When the finger reached the anterior face it opened a cyst in that region which emptied straw-colored contents. No further exploration was made. The wounds were sutured after placing a drain; four months later the patient was in excellent condition in every respect.

The author draws attention to the three points of interest in the case: (1) the etiology of the cyst, being consecutive to a strong emotion; (2) the inconstancy of the symptoms which suggested a favorable prognosis; (3) the complete disappearance of the lesion with the rupture of the serous meningitis by the exploring finger.

The author discusses the origin of acute and chronic serous meningitis. W. A. BRENNAN.

Hammes, E. M.: Traumatic Brain Lesions. *St. Paul M. J.*, 1917, xix, 328.

Hammes calls attention to the various theories advanced in the production of the initial symptoms of concussion. Kocher's theory of increased intracranial pressure, Crile and Cannon's theory of shock, and others are mentioned. The symptomatology of concussion in the milder and more severe cases is fully discussed. Great stress is placed upon the performance of early lumbar puncture in every case of cerebral concussion, not only for diagnostic purposes, but as a therapeutic agent and to lessen the post-traumatic manifestations. The only contra-indications for this procedure are

a very high blood-pressure, and symptoms of marked intracranial tension associated with a low pressure of the spinal fluid.

The author divides the traumatic apoplexies into two great groups: those in which the hemorrhage is due to a ruptured blood-vessel directly caused by the trauma, and those in which the rupture occurs after some weeks or months, due to necrosis involving the blood-vessel wall.

Post-traumatic manifestations were observed by Sharpe in 67 per cent of his cases. Every functional case should be carefully examined for organic evidences. Frequently a marked increase in the pressure of the cerebrospinal fluid can be demonstrated and is associated with a chronic oedematous brain.

Three cases are cited in full. A child three and one-half years old developed jacksonian epilepsy immediately following a trauma. Postmortem examination was negative. A young man developed symptoms of rupture of the middle meningeal artery four days after the head injury, and was successfully operated upon. A young man developed headache and mental symptoms six months after a head trauma; an operation was successfully performed and revealed an adherent dura and marked engorgement and tortuosity of the intracranial veins over the site of the injury.

Salmon, A.: The Infundibular Syndrome in a Case of Tumor of the Third Ventricle (Le syndrome infundibulaire dans un cas de tumeur du ventricule). *Presse méd.*, Par., 1917, 578.

Claude and Lhermitte reported a case of tumor of the third ventricle; among other phenomena the patient showed disturbance of sleep and polyuria. In their conclusions the authors, as the hypophysis was apparently normal, described the syndrome as infundibular and not of hypophyseal origin.

Salmon criticises these conclusions. He quotes the literature to show that there is a very close relationship between the infundibulum and the posterior lobe of the hypophysis. Cajal and others have shown the presence of nerve fibers which have their origin in the retrochiasmic region, and after having traversed the infundibulum, ramify in the hypophyseal posterior lobe.

Salmon thinks that when one considers the intimate functional relations of the hypophysis on the one hand with sleep, and on the other hand with the regulation of water in the organism, which relations have been affirmed in several cases of hypophyseal lesions; and when one further considers the very strict relationship of the hypophysis with the third ventricle and infundibulum as proved by Cushing and others who found that cerebral tumors directly or indirectly compressing the third ventricle or infundibulum cause very clear alteration in the posterior lobe of the hypophysis, it is quite legitimate to suppose that the infundibular syndrome described by Claude and Lhermitte in their case of tumor of the third ventricle is only a hypophyseal syndrome provoked by the infundibular affection. A hypo-

physical syndrome of infundibular origin would therefore appear preferable to the infundibular syndrome adopted by Claude and Lhermitte.

W. A. BRENNAN.

Doubler, F. H., and Marlow, S. B.: A Case of Hemorrhage into the Optic Nerve Sheaths as a Direct Extension from a Diffuse Intrameningeal Hemorrhage. *Arch. Ophthalm.*, 1917, xlii, 333.

Hemorrhage into the optic nerve sheath, vitreous, and retina not infrequently follows a fracture of the base of the skull, but the frequency of its occurrence in spontaneous intrameningeal hemorrhage is uncertain and no case similar to the one reported was found in the literature available.

The patient was a negress with negative previous history who was seized with vomiting while at work, followed by unconsciousness. Death occurred ten hours later. Before death systolic blood-pressure rose to over 300 and periodical examination of the fundi showed constantly increasing intra-ocular hemorrhage.

Autopsy disclosed an aneurismal dilatation of the internal carotid artery one cm. in diameter, the wall of which was extremely thin. It had not been ruptured. Other areas of thinning were found in the artery, but the exact place from which the bleeding occurred was not located.

Microscopic examination of the eyes showed the dural sheaths to be distended by a hemorrhagic ring overlying the papilla and extending in an irregular mass into the vitreous.

It is of interest that an intracranial pressure great enough to force blood into the sheaths of the optic nerves and apparently through the lamina cribrosa did not produce a papillitis; it offers evidence that time is an important factor in the development of a choked disc. S. S. HOWE.

Maranon, G., and Pintos, G.: Traumatic Lesion of the Hypophysis; Adipose-Genital Syndrome and Diabetes Insipidus (Lésion traumatique pure de l'hypophyse; syndrome adipo-génital et diabète insipide). *Ann. icon. de la Salpêtrière, Par.*, 1917, xxviii, 185.

The authors relate the case of a boy of thirteen years who was accidentally shot, the bullet passing sagittally in the middle line of the upper frontal region. No pain was felt nor was there any loss of consciousness. About a month later it was observed that he urinated copiously and that he was very thirsty; these symptoms increased. Later the abdomen enlarged very markedly. There were neither nervous nor psychic disturbances. The sexual organs showed an evident arrest of development. They corresponded to those of a boy of eight or nine years and there was no sign of secondary sex characteristics.

Radioscopy showed that the bullet was situated in the region of the sella turcica without invading the hypophyseal region proper. Injections of

pituitary extract caused marked decrease of the polyuria temporarily.

Surgical intervention was decided upon. The amount of urine passed at this time, about twenty months after the traumatism, was eight or nine liters in the course of 24 hours.

A craniectomy was done. The region of the sella turcica appeared normal. The projectile could be felt through the optic chiasm in the depth of the middle ventricle. Owing to the bad condition of the patient the operation had to be suspended. The boy died twenty-four hours later.

Autopsy showed the bullet embedded in the middle ventricle. The hypophysis was not directly injured nor compromised; its communication with the middle ventricle alone was interrupted.

The authors say that this case confirms, even better than experimental demonstrations, the theory that a hypophyseal lesion determines the adipose-genital syndrome described by Lannois, Froehlich, etc. But the case is even more striking than others reported in literature, because the arrest of genital development was at a particularly interesting age and the abdominal adipose increase could be observed.

The author discusses the relations of diabetes insipidus with the hypophysis. He criticizes the results found by authors who have reported on the matter within recent years and finds that the results show decisively that hypopituitarism is the cause of diabetes insipidus, because polyuria disappears when pituitary extract is administered. The authors' case showed this same phenomenon, as did also two other cases of diabetes insipidus which are mentioned. They are therefore of the opinion that diabetes insipidus should be classed in the hypopituitary syndrome.

Admitting this fact, the case reported is important because it demonstrates in an absolute manner that the section of the so-called hypophyseal stalk is followed by the same consequences as lesion of the gland itself. Biedl and Cushing had supposed that the internal secretion of the gland passed through the stalk into the cephalorhachidian fluid of the middle ventricle. However, in the posterior lobe there were some intact nerve fibers, whence it may be supposed that the interruption of the stalk was not complete; this would account for the slow development of hypophyseal insufficiency.

At first view, this case showing a lesion of the infundibular region without a true lesion of the hypophysis would appear to sustain the hypothesis supported by some clinicians that the lesion responsible for polyuria is not in the hypophysis but in a nerve center at the base of the encephalon. But this theory is untenable from the fact that hypophyseal opotherapy caused the polyuria to disappear.

The authors think that there is an endocrine action which physiologically acts on the kidney and regulates diuresis. The mechanism of the hypophyseal action on diuresis can only be considered as hypothetical at present. W. A. BRENNAN.

Johnston, G. C.: Roentgen Observations of the Pituitary Region in Intracranial Lesions. *Am. J. Roentgenol.*, 1917, IV, 555.

Intracranial lesions manifest themselves roentgenologically by variations in the thickness or density of different parts of the bony structure, changes in the shape or size of the sella, overgrowth of the clinoid processes, localized differences in the blood-vessel grooves, or unusual appearances of the sutures or inner table of the skull. Detailed descriptions of different pathologic processes, illustrated by numerous photographs, are given and the technique employed is described. The findings are summarized by the author in the following conclusions:

The first requisite for study of intracranial lesions, particularly of the sella, is a wide familiarity with roentgenograms of the normal conditions and mastery of a technique resulting in uniform production of roentgenograms of unusual definition and excellence.

There is a wide variation in size and character of the sella which must be considered within the limits of the normal.

Idiopathic epileptics in a large proportion of cases show definite changes in the region of the pituitary.

Pituitary struma manifests itself by deformation and destruction of the sella, rarely by visualization of the tumor itself. Intracranial tumors other than those of the pituitary frequently so manifest their presence as to permit of their detection by roentgenography.

Every patient showing evidence of optic atrophy, bitemporal hemianopsia, papilloedema or loss of vision, is entitled to a careful roentgen exploration of the sella and intracranial region.

ADOLPH HARTUNG.

NECK

Malherbe, A.: Wounds of the Cervical Region (Blessures de la région cervicale). *Bull. mtd.*, Par., 1917, XXXI, 339.

Malherbe discusses the treatment of various war wounds of the cervical region. With regard to penetrating wounds of the hyoid region there are no fixed rules with regard to suture. If the wound is not deep and there is no communication with the digestive tract it should be sutured as early as possible; but if the wound is deep, infiltrated, or infected, it is best to draw the deep parts together with a few stitches, and leave the external wound open, inserting an œsophageal sound to avoid passage of food through the wound. Repeated lavage should be used.

Similar procedure is followed with regard to laryngo-tracheal wounds. Suturing often transforms a large wound which would perhaps heal without complications into a narrow and dangerous wound. However, if the laryngo-tracheal canal is more or less sectioned and its two ends notably separated, they should be brought together by a few silk sutures, the head being placed in flexion;

this helps to approximate the ends. Even if tracheotomy has been done, it is always best not to make a complete suturing if there are deep pharyngeal or œsophageal lesions.

W. A. BRENNAN.

Torrance, G.: Goiter Surgery, with Report of 29 Cases. *Boston M. & S. J.*, 1917, CLXVII, 700.

The author reports the following series of 29 cases with but one death, which was a secondary operation in a severe exophthalmic case. The cases included the following types: large cystic, 10; exophthalmic, 10; single large cyst, 1; calcified, 1; adenoma, 3; substernal, 3.

In his article the author quotes numerous important observations from other authorities.

As regards causes, Rosenow has found that bacteria can be grown from some of the glands. Buford has found cheesy masses and pus in tonsils of children with enlarged thyroids. He finds the right lower lobe more often involved in this type of case. There may be an ancestral history of goiter. Mental shock or strain is frequently associated with exophthalmic cases.

Dubois has found an increased basal metabolism of from 50 to 75 per cent above normal in marked cases of exophthalmic goiter. Kendall has found the iodine content of the gland to be made up of two groups called A and B, and in about equal quantities. Group B has but slight physiologic action, while group A has an iodine content of about 60 per cent and a marked physiologic action. Small doses of 1:180 gr. a day has caused marked improvement in cretins.

Regarding pathologic changes in the exophthalmic goiter: Watson notes marked weakness of the quadriceps muscle in a patient climbing stairs, and in the intercostals and diaphragm by the shallow, hurried respiration. Relaxation of the muscles of the eye may be responsible for exophthalmos. There are marked changes in the myocardium, and changes in the sympathetic ganglia. Kocher says there is always hyperplasia in exophthalmic goiter, but that the thymus is enlarged in about 45 to 50 per cent of cases. By removing a portion of the thyroid the thymus retrogrades.

Taussig says the vascular changes are analogous to aortic insufficiency. Blood-pressure is higher in the thigh than in the arm (20 to 26 mm.).

Payr has made transplants in seven cases and finds the gland is gradually absorbed, in seven cases being present for two and one-half years. Kocher transplanted a gland in 93 cases, and in reports from 57 had 21 successful with no other treatment, 18 taking treatments of thyroid, and 18 failures. The gland should be living and transplanted into vascular tissue, spleen, or bone-marrow.

C. A. BOWERS.

Judd, E. S.: Results of Operations for Exophthalmic Goiter. *Long Island M. J.*, 1917, I, 405.

After a brief résumé of the various theories as to the cause of exophthalmic goiter, the author proceeds to give the results of operation upon

176 patients in the year 1900. Fifty-five cases or 46 per cent are considered cured as far as known or are entirely relieved of their former symptoms as far as examination can reveal. Some of these cases had ligation only and they may show later recurrence. It is the custom at the Mayo Clinic to do a preliminary ligation under local anesthesia, and if no reaction follows, at the end of about seven days a resection is done. In case severe reaction follows the first ligation, the right superior vessels are ligated after the reaction subsides. After this second ligation a period of three months is allowed to elapse before a thyroidectomy is done. Some of the patients in those cases were classified as cured have not returned for the thyroidectomy.

Twenty-two cases or 18 per cent were practically cured of all their symptoms, though at times they still show slight evidence of the disease. Seven cases or 6 per cent were markedly improved though evidence of their old trouble is almost constantly present.

Five cases or 4 per cent received comparatively slight benefit from the operation. Eight cases or

6 per cent derived little or no benefit from the operation.

Eight of the thirteen unsuccessful cases had a considerable degree of dilatation of the heart and several of them had edema of the extremities at the time the operation was performed.

The functional results following operation have been satisfactory. The scar from the low collar incision is inconspicuous and the normal motion of the head and neck returns in a few weeks. The disturbance of voice noticed in some instances has always proven but temporary.

Of the 176 patients operated upon in 1900, 7 died while still in the hospital. The author states, after a brief résumé of all the cases which have died, that they were extremely toxic and the cause of death was a continued intoxication which had already produced irreparable damage, usually in the heart, liver, and kidneys.

He concludes from this study that an absolute cure may be expected in about 46 per cent, in addition to which number about 23 per cent will be practically cured. Six per cent have reported that they received no benefit.

ELLIS FISHER.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Anderson, J.: The Surgical Treatment of Severe Penetrating Wounds of the Chest in a Casualty Clearing Station. *Brit. M. J.*, 1917, ii, 575.

The author classifies wounds of the chest, as seen at an advanced casualty clearing station, in two groups from the point of view of prognosis. The first group includes entrance and exit bullet wounds, entrance and exit shrapnel-ball wounds, and wounds caused by small fragments of high explosive missiles. These cases do exceedingly well if treated expectantly and aspirated or operated upon when occasion demands.

The second group includes wounds caused by large irregular fragments of high explosive shell which have lodged in the thorax. These are almost always associated with clothing and infection carried in, and open "sucking" wounds of the chest wall. If treated expectantly, only a very small percentage of these cases reach the base hospital and many of those that are evacuated die from the complications of their wounds. In this group are also included tangential wounds of the thorax, enflaming the ribs and driving portions of bone into the pleura and lung, and entrance and exit bullet wounds in which the exit wounds are "explosive" in character. The prognosis in these cases is usually not so severe, but an unduly large percentage develop an infected hemothorax unless the chest wall is treated energetically. The cases in the second group have usually died at the casualty clearing

station from sepsis and exhaustion; many of these cases could be saved by immediate surgical intervention on the lines adopted for other wounds.

The principles of operation are to completely excise the wounds in the chest wall, wipe out the pleural cavity, if the lung has collapsed and hemothorax exists; to search for foreign bodies and remove fragments; to close the wound completely.

Solutions of flavine and brilliant green have been used without any untoward effects and probably with advantage. The aim of the operation is prophylaxis against sepsis. If it fails, a secondary drainage operation may be required.

E. B. FREILICH.

Roberts, J. E. H., and Craig, J. G.: The Surgical Treatment of Severe War Wounds of the Chest. *Brit. M. J.*, 1917, ii, 576.

The authors report the results of their experience in the treatment of penetrating wounds of the chest. Of 199 cases, 108 were evacuated without operation, 24 died without operation, and 67 were operated upon. Of these 67 apparently forlorn hopes, 34 eventually recovered and were evacuated to the base, and 33 died. Of the 33 fatal cases, 16 had other gross lesions which were more directly responsible for the fatal result than the operation. Excluding these cases, the rate of mortality in the 51 remaining cases was 33.3 per cent, and the recovery rate was 66.6 per cent.

The principles followed in these cases involved early operation, free excision of all infected tissues,

removal of the foreign body, and cleansing of the pleural cavity or wound of the lung, followed by accurate suture of the lining membrane and tissues over it whenever possible without drainage. No cases were drained unless the chest wall could not be closed owing to the condition of the patient, or if infection of the lung or of the pleura as distinguished from its contents was definitely established.

Results have shown that even though anaerobic bacilli or streptococci are present, the pleural sac can be completely closed with success. The most common cause of death in the chest cases with no other injury was septic bronchopneumonia of the uninjured lung. As a prophylactic measure, therefore, creosote was given and also antistreptococcal serum in severe cases, which seemed to have some value.

E. B. FREILICH.

Rudolf, R. D.: The Later History of Cases of Gun-shot Wounds of the Chest, with Retained Missiles. *Lancet*, Lond., 1917, cxlii, 700.

Rudolf attempts to ascertain from a study of fifty cases followed to their ultimate conclusion whether or not a foreign body in the chest should be immediately removed. All cases showing a foreign body deeper than the ribs are included, irrespective of whether or not they had penetrated the lung. Only two died. In the case of one an abscess formed around the foreign body. The abscess was drained and the foreign body removed. The patient died from hæmorrhage on the eleventh day after operation. The other patient died three days after the removal of a rifle bullet from the lung, apparently from pulmonary thrombosis.

Twelve of the others were permanently disabled for further military service. The remaining thirty-six, or 72 per cent, were fit for some duty. Nearly all complain of some cough, shortness of breath and pain in the chest, but the author says he cannot say that they complain more than those in whom the missile has passed through the chest and out. Large pieces of shell and shrapnel in the author's opinion should be removed at once because of danger of gross infection and severe hæmorrhage.

C. A. HEDBLÖM.

Harris, M. L.: Hernia of the Breast. *Surg. Clin. Chicago*, 1917, i, 959.

A girl about fifteen years of age presented herself on account of an apparent enlargement of the right breast. She was well developed physically and her health in every respect quite good; menstruation appeared at the age of thirteen and was normal in type and regularity. A year previous it was noticed that the right breast, which was slightly larger than the left, was becoming more prominent about the nipple.

The girl had had no serious illness, and aside from the condition of the breast, had no trouble whatever. An examination of the breasts showed the right

slightly larger than the left and both quite well developed for a girl of her age. The nipples were small and flattened. From the center of the right breast there protruded a large dome-shaped mass, measuring 7 to 8 cm. in diameter at the base and raised about 6 cm. from the surrounding surface, the nipple occupying the apex of the mass. The areola, which was normally pigmented, was considerably enlarged and covered the top of the mass. The mass felt firmer than ordinary fat and was distinctly lobulated.

Surrounding the base of the mass could be felt a well-defined subcutaneous ring with a distinct, rather sharp edge. The ring felt like the opening in an umbilical hernia, except that the edge of the ring was not so thick, while the mass felt very much like a mass of omentum in an umbilical hernia. With gentle pressure the mass could be pushed back through the ring, very much as one reduces an ordinary hernia. The breast then resumed a normal appearance with the exception of the areola, which became wrinkled and puckered. On removing the pressure the mass immediately reappeared by sliding out again through the ring. As it appeared, the rotundity of the breast diminished accordingly. It was evident that the mass was the gland proper which had slipped through a rather large opening in the subcutaneous fascia which normally covers the breast and retains it in place.

Under local anæsthesia four small incisions, each about 8 mm. in length, were made in a radiating direction, dividing the circumference of the areola into four equal parts. The incisions extended through the skin and were located just within the ring of subcutaneous fascia through which the breast was escaping. A long straight needle threaded with soft twisted silk was introduced through one of the small incisions so as to pick up the edge of the ring. Several stitches were taken in the edge of the ring until the point of the needle had reached the next small incision 90 degrees removed, when the needle was brought out. It was then re-introduced through the same opening and the next 90 degrees of the circumference of the ring taken up in the same way, and the needle brought out at the next small incision. This procedure was repeated around the edge of the ring until the needle was finally brought out at the incision through which it first entered.

There was now a circumferential subcutaneous stitch in the edge of the ring, three more stitches were placed in the same way, each a little farther out in the edge of the ring, making four rows of silk sutures surrounding the opening. The sutures were then drawn up, narrowing the ring, but leaving it large enough to give free passage to the ducts leading to the nipple. The threads were all tied, the ends cut short, and the four small incisions closed with horsehair.

The result of the operation has been very satisfactory, and at the end of a year there has been no recurrence.

EDWARD L. CORNELL.

Manfredi, L.: A Case of Diplococcic Empyema with Early Perforation in the Lung (Su di un caso di empyema diplococcico perforato precocemente nel polmone). *Palchin*, Roma, 1917, xiv, 100; *med.*, 462.

A case of empyema in a soldier is reported. After six days of fever, signs of incipient diplococcic pleuritis appeared. Puncture of the left pleural cavity drew a seropurulent fluid containing capsulated diplococci. On the eleventh day the patient vomited about 350 cc. of purulent coffee-colored fluid. A thoracentesis drew similar fluid in which the diplococcus was found but only sparsely.

Purulent pleuritis, which is usually a secondary manifestation, may be due to different micro-organisms, but it is usually due to the pneumococcus. The figures of different investigators show that from 19.4 to 82 per cent of cases are pneumococcic. Others find the streptococcus to be the most usual agent. A purulent pneumonic pleuritis usually terminates by vomiting, but this does not usually occur until between the fifteenth and thirtieth day. The opening of the empyema into the lung on the eleventh day in the case reported seems worthy of notice.

W. A. BRENNAN.

Hozie, G. H.: The Adult Thymus and Its Two Types of Dysfunction. *J. Missouri St. M. Ass.*, 1917, xiv, 389.

The author gives the embryology and anatomy of the thymus gland with a detailed description of the microscopic histology. The symptoms of persistent or enlarged thymus in children are largely mechanical due to pressure, as obstructive dyspnea and oppression of the upper chest, accompanied by the physical findings of submanubrial dullness with possibly stridor over the manubrium due to compression of the trachea by the enlarged thymus. The X-ray shows distinctive thymus shadows. In adults the symptoms, usually due to internal glandular secretion, are manifested by weakness, shortness of breath and weakness of apparently strong muscles, practically myasthenia gravis, minus bulbar symptoms.

Fluoroscopic examination differentiates it from: (1) subaternal thyroid in which the mass moves with swallowing; (2) enlarged aorta or aneurysm which is manifested by pulsation; (3) peribronchial lymph glands in which the clear space anterior to the spine is filled. A positive D'Espine confirms the latter. Microscopic examination of tissue shows a predominance of lymphoid elements in the hyperplastic thymus of childhood, the influence being mainly mechanical. Where history demonstrates endocrine disturbances as in reactivated thymus glands in adults, the epithelial elements predominate.

The treatment in children consists of the operative removal of the gland or its destruction by X-ray. In adults thyroid and sex glandular extracts are used, the latter apparently being antagonistic to the thymus. Hypodermic arsenic is a valuable adju-

vant. If unavailing, heavy therapeutic X-ray doses or excision of the gland may be resorted to.

H. H. FRIEDER.

TRACHEA AND LUNGS

Rowland, V. C.: Tracheal Displacement and Compression in Intrathoracic Disease. *Cleveland M. J.*, 1917, xvi, 715.

Rowland believes that the frequency and degree of tracheal displacement and compression in intrathoracic disease are not generally appreciated. Many of the symptoms in intrathoracic disease are due to involvement of the trachea. A symptomatology of tracheal displacement *per se* may be established, which is of practical value in diagnosis and treatment. These changes in the trachea are most commonly present in tuberculosis. In early mild grades there is frequently a marked convexity of the trachea, usually toward the affected side, best seen on X-ray plates. Sometimes there is also anteroposterior flattening and sometimes rotation by traction. In fibroid processes at the apex tracheal displacement may be extreme. In large pleural effusion or empyema angular displacement of the trachea may produce the typical dry, brassy cough of aortic aneurism. Mediastinal tumor, tuberculous bronchial glands, Hodgkin's disease, and even the cold abscess of Pott's disease, by pressing on the root of the trachea may produce such a cough.

The subjective symptoms of tracheal displacement and compression, independent of underlying cause, are cough, dyspnea, stenotic stridor and bronchial spasm. The cough is of a dry, irritative type. Dyspnea is due to tracheal stenosis.

Objectively, inspection and palpation of the neck may show displacement. The X-ray shows marked displacement of the mediastinum and of the position of the trachea. Laryngoscopic examination may show a rotation of the vocal cords through an angle as high as thirty degrees. Percussion may give an overtone of tympany and bronchial breathing at the apex on the side toward which the trachea is displaced.

Marked tracheal displacement is in general a contra-indication to artificial pneumothorax because it implies the presence of pleural adhesions. Absence of tracheal displacement is evidence of only a little or of no fluid in the pleural cavity. Displacement of the trachea helps to differentiate hemothorax from conditions which may simulate it, such as pneumonia and the progressive collapse of the lung from bullet wounds, as in cases reported from the front.

C. A. HEDGECOCK.

Jackson, C.: A New Method of Working Out Difficult Mechanical Problems of Bronchoscopic Foreign Body Extraction. *Laryngoscope*, 1917, xxvii, 725.

In cases of foreign bodies lodged in the bronchi which prove difficult to remove, and in which the use of stock instruments has been unavailing, the

author has been able to solve the problem by means of probes and various forms of instruments bent and made to suit the purpose demanded by the mechanical problem presented in the particular case. These were tested out on a manikin, and if successful, were used on the patient, usually with success.

The author concludes the following:

1. Tool-steel probes formed by the bronchoscopist himself to suit the particular case are an addition to the means of solving mechanical problems of bronchoscopic foreign body extraction.

2. To pursue a foreign body downward is to court disaster.

3. Care is necessary to avoid forming hooks that could catch in the bronchi or become entangled in the foreign body. The shape should be such as to favor unscrewing out, if caught. H. H. FREILICH.

Murphy, J. W.: Bronchoscopy and Œsophagoscopy. *N. Y. St. J. Med.*, 1917, xvii, 513.

The author first used the Kirsten laryngeal speculum in 1894 for the direct examination and treatment of the larynx. Later, with the evolution of the bronchoscope and œsophagoscope he was able to extend his examinations below the vocal cords and into the inner recesses of the lungs and the entire œsophageal tract. There followed a multiplicity of instruments of various designs, so that it was difficult to decide between the good and the bad and a rather expensive outfit seemed necessary. Experience has proved that such is not necessarily the case and that good work can be done with a few well-selected instruments.

The technique suitable for this line of work is obtained only by long practice. Jackson finds after years of experience that he is able to do his most satisfactory work with many of his earlier devised instruments. No instrument has yet been devised that can overcome a faulty technique. Delicate manipulation at the end of a long narrow tube, with the vision of only one eye available, requires continued practice.

The suspension method of Killian at first presented many difficulties, but many of these have been overcome by the modified technique of Lynch of New Orleans. The mechanics applied in suspension laryngoscopy, if not properly directed, are capable of causing serious and permanent damage. Under the suspension method the entire larynx is exposed and both hands are free to do any surgical work required. For operative and diagnostic purposes, this method is ideal.

The position of the patient for bronchoscopic and œsophagoscopic work is a question each operator must decide for himself. Some prefer the prone position, others prefer the upright position.

The question of whether to use an anæsthetic, either local or general, is often difficult to decide. In the case of children with a foreign body in the bronchi, the author prefers to use no anæsthetic, either local or general. One of the great dangers

in this line of work is a prolongation of the examination in an attempt to extract the foreign body. Several short examinations are preferable to one prolonged examination.

The author regards every foreign body in the bronchi or œsophagus as dangerous, and the longer the removal is delayed, the more serious the prognosis becomes. The author has had 3 fatalities out of 112 cases, and the more he sees of this work, the more he is convinced that every foreign body in the bronchi or œsophagus is dangerous to the life of the patient.

The author reports a case in which a metal cap from a beer bottle was successfully removed from the œsophagus of a five-year-old boy, where it had been for eight months; he also removed a sliver of chicken bone that had been pushed under the mucous membrane of the œsophagus, in an attempt to force the foreign body on into the stomach.

Petit de la Villeon: Presentation of 25 Cases Operated upon for Intrapulmonary Projectiles (Presentation de 25 blessés opérés de projectiles intrapulmonaires). *Bull. Acad. de méd., Par.*, 1917, lxxviii, 604.

In the cases reported the extraction was always made under the guidance of the radioscopic screen. The projectile particles were situated in the lung at depths varying from 3 to 10 cm. in the parenchyma; all were cured without complication.

Since opening a new service in Paris the author has treated 104 cases. All recovered. His total statistics show 234 cases operated upon for intrapulmonary projectiles, with 233 recoveries.

W. A. BRENNAN.

Jacobaeus, H. C., and Key, E.: Some Experiences in the Operative Treatment of Tuberculosis (Einige Erfahrungen von operativen Eingriffen bei Lungentuberkulose). *Nord. Med. Ark., Stockholm*, 1916, xlix, Kirurgi, H. 6, No. 23.

Concerning the operative treatment of tuberculosis, the authors agree that thoracoplasty is only indicated in cases where pneumothorax treatment has failed or is not applicable. The forms of tuberculosis which yield the best results to this treatment are those of shrinking chronic phthisis with one lung cavernous, and symptoms of displacement of heart and trachea. The results in the operated cases have verified this view. It is also indicated in cases of unilateral lung tuberculosis with repeated hæmorrhages.

In cases where there is partial destruction of one lung with cavernous areas in the superior lobe but a relatively sound inferior lobe, a thoracoplasty would entail a considerable loss of sound parenchyma. Such cases must be considered individually; it may be possible to apply pneumothorax above the inferior lobe, and a thoracoplasty over the superior lobe in adaptable cases. Encouraging results have been obtained by the authors and others in such cases.

Generally the authors recommend relatively early operative intervention in cases where a sufficient pneumothorax cannot be obtained. Sanatorium treatment of cavernous cases gives only temporary improvement and even after years of treatment complete recovery is seldom obtained. It is known that tubercular foci in a sound lung are curable after thoracoplasty; but the operation puts a great strain on the organism. The author thinks that the indications of extension of the tubercular process should be very strong to warrant thoracoplasty as against pneumothorax in such cases. The advantage of thoracoplasty is that it does not give rise to pleural exudate, which is an ominous accompaniment of pneumothorax.

The topographical location of tubercular foci, enlargement of glands, concomitant changes in the larynx, etc., if contra-indications for operative intervention, are generally also contra-indications for pneumothorax.

Different authors give varying indications for thoracoplastic intervention. Quincke recommends operation in fibrous forms with a cavernous condition of the superior lobe; Spengler emphasizes the shrinkage of the lung and recommends operation in cases with chronic empyema; Turban requires total or almost total destruction of one lung with tendency to shrinkage and a rigid chest wall; Lederer operates only in progressive slowly developing cases with destruction extending over

the whole lung; Friedrich holds that protracted hemorrhage is the chief indication for operative treatment.

The authors believe that the topographical extent of the tubercular process in the healthy lung is not a determining or decisive factor for operation, but rather that the indications must be obtained from the symptoms and tendency of the case.

W. A. BRENNAN.

HEART AND VASCULAR SYSTEM

Fredet, P.: Extraction of a Fragment of Shell from the Anterior Wall of the Right Ventricle (Extraction d'un fragment d'obus logé dans la paroi antérieure de ventricule droit). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1887.

The patient in the case reported was operated upon more than 6 months previously. Recent electrocardiograms show satisfactory results. It appears that if the traumatism has not destroyed any important center in the heart, and if surgical interference has respected vital centers, wounds of the heart recover without any functional trouble. This offers encouragement to the surgeon to proceed when the indications are compelling, as for instance when a projectile is free in the cavity. Operation does not run any risk of aggravating the situation by giving rise to functional disturbance.

W. A. BRENNAN.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Reynders, R.: Posterior Drainage in Abdominal Surgery (Le drainage postérieur en chirurgie du ventre). *Arch. méd. belge*, 1917, lxx, 1009.

The author emphasizes the value of abdominal drainage, based on his experience as a Belgian army surgeon. He finds that the gauze drain is for given reasons the most satisfactory in abdominal work; but that in order to make the mechanism of drainage satisfactory it must be from above downward and not, as now used in abdominal surgery, from below upward.

He reports two cases of soldiers who had received shrapnel wounds with the entry orifice in the right lumbar region. In both cases the posterior entry orifice was stripped and the projectile trajectory followed until the peritoneum was reached. This was found open, allowing the exudation of foul-smelling fluid. A lateral laparotomy at the extreme edge of the right rectus was made, and after the lesions were treated, two mesh drains were placed, one leading to the anterior laparotomy incision and the other to the wound orifice. On the following days the author found when renewing the dressings that the anterior mesh was scarcely moist

while the posterior mesh was quite wet. Drainage was almost exclusively posterior.

The creation traumatically of a counter-incision to the anterior incision of the laparotomy has shown the author that a posterior drainage of the abdomen is possible and effective. Such a drainage is theoretically best because when the patient is in decubitus the drainage is from above downward.

In order to establish a site for the counter-incision in posterior drainage, the author refers to that space between the inferior pole of the kidney and the iliac crest, inside the colonic area, extending about 4 cm. to the right and 3 cm. to the left, where the abdominal wall is composed only of serosa, muscles and skin. Petit's triangle is in this space, and every surgeon can easily find it. The patient may be placed in slight lateral decubitus, right or left, according to the case, the pelvis a little high and the lower limbs flexed. Anterior drainage through the laparotomy wound facilitates posterior drainage.

The author criticizes the ventral decubitus which was recently recommended after laparotomies by Lerda. The position is painful for the patient and the author finds many disadvantages in it from a surgical viewpoint.

W. A. BRENNAN.

Meyer, W.: Rectangular Flap Incision for Operations Within the Upper Abdomen. *J. Am. M. Ass.*, 1917, lxi, 1677.

The author reviews the tendency to deviation from the usual incision in the long axis of the body as shown by the work of Trendelenburg, Pfannenstiel, and Sprengel. The latter showed that the tendency of the wound edges in the longitudinal wound was to gape under strain, while the transverse incision tends to approach its borders under the same conditions. More recently in this country Farr, Moschowitz, and the author have called attention to the decided advantage of the transverse incision, in that closure is easy; a reopening will hardly ever occur, even if the wound becomes infected; and necrosis of fascia in case of infection within the abdomen occurs rarely.

The disadvantages of the transverse incision in the upper abdomen are the difficulty in removing the appendix, insufficient exposure in gall-bladder cases, and inability to properly rotate the liver in the same cases. To overcome the first difficulty, the author has at times extended the right end of the incision downward.

The author describes the two types of rectangular flap incisions for operations within the upper abdomen, especially on the right side. The first of these was proposed by Koenig and Kehr and consists in making an incision through all the layers of the abdominal wall from the xiphoid along or through the inner border of the right rectus, and then extended at right angles to about the anterior axillary line. Before dividing the rectus it is stitched to the fascia as in the ordinary transverse incision. The access obtained is excellent. Drains, if needed, may emerge at either the upper or lower angle.

In the other, or Perthe's incision, a rectangular skin muscle flap is raised. All the structures down to the posterior sheath of the rectus and peritoneum, the muscle being stitched to the anterior sheath only, are incised and reflected back to the costal margin. The abdomen is then opened parallel to the costal margin and one-third of an inch in front of the point of exit of the two intercostal nerves.

The principal advantages of this incision are:

1. Wide access is gained to the upper abdominal cavity, much better than by the longitudinal or transverse incision.

2. There is the same preservation of the muscle innervation as in type one, a factor which gains in importance in strong muscular male patients.

3. The incision through the posterior sheath of the rectus and the peritoneum, down to its lower angle, is nowhere in the same line with the skin incision. It is situated on a higher level and runs in a different direction than the transverse cut dividing the anterior sheath of the rectus and the muscle, a point which greatly adds to the firmness of the resulting abdominal scar, and thereby guards against the occurrence of a ventral hernia, even in suppurative cases.

4. The oblique cut through the transverse fascia and peritoneum usually meets the very border of the liver, or, in cases of ptosis, its convexity is the same as the Courvoisier incision, which practically runs in the same direction as the oblique cut in Perthe's incision; however, it divides all the layers of the abdominal wall in one and the same line, including the nerves. The liver can be turned upward or pulled out in front of the abdominal wall, as the case may require and the fixation of the liver will permit.

5. The small intestines do not crowd into the wound; usually only the omentum and the colon, or the omentum; the colon and the pyloric end of the stomach with the duodenum come into view. The small intestines remain protected; less packing is required.

6. On the left side of the median line, the additional cuts made through the seventh costal cartilage near the sternum and from the seventh to the tenth individual rib cartilages near their junction with the bony substance, as needed for the osteoplastic raising of the costal arch in stomach operations near the cardia, are rendered easier than in type one. The costal arch is to be approached in this osteoplastic operation underneath the belly of the rectus muscle, and above the transverse fascia. Here it can be easily and thoroughly exposed.

Drainage is carried out at either end of the incision. The patient must be completely relaxed by sufficient anesthesia and elevation of the upper part of the body. The posterior sheath of the rectus and the peritoneum are closed by a continuous, not interlocking, catgut suture and the anterior sheath of the rectus is then stitched, after having placed two cigarette drains beneath the flap. Closure is facilitated by placing one interrupted suture at the angle, and one silkworm-gut may be used at this point. The skin is closed by fine catgut or silk. After operation the patient is placed in an exaggerated right Syme's position for the first twenty-four to thirty hours.

The author has used the rectangular incision of the first type in 3 cases, and the second or Perthe's type in 21 cases. The latter, in particular, on account of the excellent exposure and ease of closure, represents a valuable addition to our resources. No one incision represents a panacea. One must adapt the incision to the individual case, and not the case to the incision.

S. A. CHALFANT.

Stassen, M., and Voncken, J.: *The Peritoneum in War Surgery* (Le péritoine en chirurgie de guerre). Paris: Baillière et Fils, 1917.

The extensive study of war wounds involving the peritoneum comprising 160 pages by the Belgian surgeons Stassen and Voncken is a first hand contribution based on their actual clinical experience in one of the large hospitals on the Yser front.

The authors class abdominal injuries according to the following general scheme: (1) extraperitoneal, (a) parietal or (b) visceral; (2) intraperitoneal,

(a) without rupture of the intestinal tract, or
(b) with intestinal tract rupture, univisceral or multivisceral.

A wound involving the external osteomuscular wall only or an organ in the visceral space without touching the serosa is an extraperitoneal wound. Chapters are devoted to the discussion of parietal and visceral extraperitoneal wounds with clinical illustrative cases.

Visceral extraperitoneal wounds have given the authors symptoms more marked, more lasting, and more alarming than parietal injuries. Such symptoms have often caused doubt between a true and false penetration of the peritoneum.

The symptoms which give the impression of peritoneal penetration are: dullness over the liver, muscular rigidity of all or part of the anterior wall, vomiting, small pulse, facies abdominalis, stoppage of flatus and faeces which persists more than twenty-four hours, retention of urine, traumatic shock.

Any one or more of these signs may show in an abdominal wall injury, but the occurrence of all together is rare. When the whole syndrome is observed, the reason is often found in causes outside the peritoneum. Before the war the existence of any of these symptoms would usually have been considered by many authors as indicative of intraperitoneal penetration, but the authors show that these symptoms can exist in clearly negative lesions which do not involve the peritoneal cavity. For instance, tympanites was observed in 36 per cent of their series of extraperitoneal wounds.

Regarding intraperitoneal wounds without perforation of the digestive tract, it seems at first view that active operative intervention does not effectively cure patients who would recover spontaneously. The authors think, however, considering the circumstances of time and place at the front, and the arrival of wounded in the hours immediately following the traumatism when there is often no pathognomonic symptom demanding intervention, that because of the necessity of intervention in cases where a perforation actually exists, an exploratory laparotomy should be done. There can be no certainty concerning the identity of the lesions and the symptomatology so as to permit a policy of abstention to be followed. In 16 early cases in which the authors refrained from operation 11 died and autopsy showed that in 10 of these there were multivisceral peritoneal lesions.

The cases of intraperitoneal univisceral wounds observed have clearly shown that there are no early pathognomonic symptoms. There is no sign which differentiates them from non-penetrative wounds. The classical syndrome was only clearly observed in 7 out of 16 actual cases. Generalized rigidity of the anterior muscular wall was only seen in 8 of these cases, other symptoms occur similarly. The special conditions in which a surgeon is placed at the front oblige him to waive indications and to proceed at once to operate in order to dispel any doubt. To wait for the development of positive

signs of perforation is generally to abandon the chance of saving the patient.

In 180 cases of operated univisceral wounds the authors have had 65 recoveries and 115 deaths. In 110 cases of multivisceral wounds there were 16 survivals and 103 deaths.

All the signs of peritonitis which are observed in patients without peritoneal perforation are found also in true perforations and it is only a question of degree which differentiates one from the other. There is no absolutely constant symptom. There is perhaps only one sign which denotes peritoneal perforation, viz., the rigid abdomen, especially when accompanied by a clear superior costal respiration. But it is not always present even in the later stages. Thus this important symptom which is not usually found in non-penetrative lesions cannot be relied upon to be present in true penetrating wounds.

As regards treatment, cases with a suspected perforating wound of the digestive tract ought to be operated upon immediately at the advanced operating posts two or three miles from the firing line and ought not to be exposed to the risks which occur in evacuation to distant hospitals. This rule applies even when the wound orifice is at a distance from the peritoneum when the trajectory might cause a supposition of a peritoneal lesion. At the advanced surgical post examination and diagnosis is made. If the wound is in the abdominal region the trajectory should be systematically followed layer by layer until the projectile is reached. Often this is found to be extraperitoneal, and unnecessary opening of the peritoneal cavity can be avoided.

Through and through wounds which do not at first suggest positive penetration are best treated by a median explorative laparotomy. In all doubtful cases recourse should be made to exploratory laparotomy.

The authors think that even in the case of those badly shocked who show the complete abdominal syndrome and whom massive infusions have failed to revive, operation should be the rule. Such a condition may be due to an intense hæmorrhage, and if so, the only chance is to close the bleeding vessel. It is impossible actually to differentiate between traumatic shock and hæmorrhagic shock. Even at the risk of adding the operative shock to the traumatic shock, the authors think that it is the surgeon's duty to proceed systematically with operation because the wounded man has the chance of being saved from acute anæmia.

The article offers a detailed study of the clinical aspect of abdominal lesions to those who are interested.

W. A. BRENNAN.

Slattery, R. V.: An Operation for the Radical Cure of Inguinal Hernia. *Lancet*, Lond., 1917, cviii, 455.

The operation is described in the following steps. The inguinal canal is operated upon as in Bassini's operation. The cord is freed from its bed and

retracted; the sac is isolated and dealt with; the weak fascia between Poupart's ligament and the conjoined tendon is picked up with forceps and is divided parallel to Poupart's ligament, care being taken not to injure the deep epigastric vessels. The fascia transversalis is freed thoroughly from the retroperitoneal fatty tissue both upward under the conjoined tendon and downward to expose the deep aspect of Poupart's ligament. The fleshy arch of the internal oblique muscle is retracted; forceps are applied to the glistening fascia on the deep aspect of the conjoined tendon so as to draw it into the wound. This fascia brings with it the lower aponeurotic portion of the transversalis muscle.

The mattress suture is used to approximate the fused fascia and aponeurosis to the deep aspect of Poupart's ligament. The outermost suture is introduced first. The aim is to restore the fascial internal abdominal ring, placing the restored ring under the supporting fibres of the internal oblique muscle. By carefully retracting Poupart's ligament forward and passing the needle from within outward to emerge where Poupart's ligament blends with the fascia lata of the thigh, these sutures are safely introduced. It is important that the remains of the fascia transversalis still adherent to Poupart's ligament should not intervene between the opposed structures; this is easily avoided if the fascia is retracted forward with Poupart's ligament. When tying the mattress suture nearest the abdominal ring, care should be taken not to narrow that ring unduly. The cord is allowed to fall back into its bed. The external oblique aponeurosis is sutured and the wound closed. E. C. ROBITSHEK.

Brossy, J.: The Hernia Operation in Children, and Its End-Results (*L'opération de la hernie chez les enfants et les résultats éloignés*). *Rev. méd. de la Suisse Rom.*, 1917, xxxvii, 473.

Brossy's study is based on 287 operated cases seen after a minimum period of 9 years after operation. The operations were carried out in the Children's Hospital at Lausanne between 1888 and 1905. During this period 333 cases of hernia were operated. There was no case of crural hernia in the whole series; the majority were inguinal.

As regards inguinal hernia, those who are familiar with infantile surgery will realize that there are two distinct types. In one the peritoneal sac and tunica-vaginalis process are identical, and separation is difficult and artificial. In the other the sac is quite independent and is easily separated from the cord and testicle with which it has no relations. This simple classification corresponds to the facts, and is capital from the operative viewpoint. Of 215 operated cases in recent years 21 were found to be of the first variety; in 12 there was difficulty in separating the sac and in 182 it was quite easy to do. Visceral adhesions are not met with, as in the case of adults; the contents are always free and reducible. In these 215 cases, ectopia was found only 7 times.

As regards sex incidence, inguinal hernia was

observed in 28 cases in girls, as against 215 in boys. In 19 of the 28 cases the hernial sac was intimately related with the round ligament, ovary or tube. Strangulation was observed only in 6 cases out of 250.

With regard to mortality, of 642 cases operated upon for hernia between 1888 and 1915, 9 died during their stay in the hospital; 2 of these were not due to operation, and 4 deaths were apparently due to the conditions of hospitalization, which were not good at Lausanne prior to 1912. Brossy thinks that children of tender age should never be operated upon without necessity except in an especially suitable hospital. Of the 9 cases of death, 5 were double inguinal hernia, a mortality of 55 per cent. Of these reviewed, 13 per cent had a hernia of this variety.

Brossy states that the radical operation for inguinal hernia in children gives excellent end-results when carried out under suitable hospital conditions. Operation is easier than in the adult, as many of the secondary deformations have not had time to develop. In infants under twelve months operation is indicated only in certain conditions, menaced strangulation, large unmanageable hernia, etc. Above twelve months the indications for operation occur in the large majority of cases if conditions are otherwise satisfactory. The limit of two years which is generally admitted as the lower limit of operability does not appear to the author to have any precise bearing.

As regards the operative method a simple operation was carried out in 20 cases. These gave 20 per cent recurrences. The author therefore thinks this procedure is unfavorable and to be condemned without discussion.

A table gives complete statistics showing the sex, the side attacked by hernia, and the age at time of operation.

Of these 299 cases of operated inguinal hernia, 236 have been followed more than 9 years with the following results: For right inguinal hernia, there were 121 persistent recoveries; for left inguinal hernia, 67 recoveries; for double inguinal hernia, 27 recoveries; for double inguinal hernia, operated on one side only, 5 recoveries. Recurrences of right inguinal hernia were 13; left inguinal hernia, 4.

This shows 6.44 per cent recurrences and 93.56 per cent cures and justifies the radical cure in infantile inguinal hernia. The recurrences were generally late, i. e., between 4 and 8 years.

In addition to the inguinal cases, 25 cases of umbilical hernias were observed in 19 boys and 6 girls. Of these 16 were operated and all are perfectly cured.

The author's general conclusion from all the cases is that the radical treatment of hernia in children is an excellent operation and that its end-results are far superior to those obtained in the adult. The older the child, the greater are the chances of recurrence. W. A. BRENNAN.

Mayo, C. H.: *Enterostomy and the Use of the Omentum in the Prevention and Healing of Fistula*. *Ann. Surg.*, Phila., 1917, lvi, 368.

The author gives in detail the handling of a case of postoperative obstruction and the performing of an enterostomy.

In the majority of cases the obstruction occurs during the first few days following an operation. In obstruction of the small intestine there is more danger of toxemia; in the large intestine, from perforation and peritonitis.

After abdominal operations there is usually stasis for twenty-four hours, which acts as a protective measure. Enemas are given the day after operation. If there is no relief, lavage, laxatives, hypodermic injections of pituitrin or eserine are given during the second night and third day. If these do not bring relief, it is concluded that the obstruction is complete. The patient vomits and is toxic. On the evening of the third day or the morning of the fourth he is taken to the operating room and the incision opened. If there is general peritonitis an enterostomy is made without exploration. If there is no peritonitis, exploration is made and the cause, which is usually an adhesion, is removed; then, of course, enterostomy is not necessary. If operation is delayed until late in the fourth day, toxic paresis may complicate the existing conditions.

In early operation the incision is opened; in late, a second incision may be advisable. A low lying loop of distended bowel is brought up, a segment freed of gases or fluids and controlled by rubber-covered forceps above and below. At a point opposite the mesentery a silk purse-string suture with a diameter of about half an inch is applied. A perforation of the bowel is made in the center with a knife or cautery and a No. 10 or No. 12 catheter is inserted several inches into the intestine. Two successive purse-strings may be used, by the Stamen-Kader method, or that of Witzel, depressing the catheter into the wall and suturing the folds for a distance of one and one-fourth inches. For security and to promote healing, the author passes the catheter through the perforated omentum and for fixation includes the parietal peritoneum, the omentum and intestine in three sutures.

The loop of bowel used may be high in the intestinal tract, leaving but a small amount for nutrition. In this case it is necessary to institute rectal feeding and saline infusions until the adhesions subside.

A fistula may occur at the point of enterostomy if it is made without the protection of the omentum; the omental graft furnishes granulation to aid in the closure. If a fistula occurs it may be closed by the Dwyer-Pallister method, by inserting through it into the intestine an oblong button held by thread in the eyes, or through a perforation in the obturator which holds it up against the wall of the bowel at the point of leakage; the threads are then passed through a flat button on the skin side of the fistula.

When granulations form, the threads are cut and the inner button passes through the intestine.

C. A. BOWERS.

GASTRO-INTESTINAL TRACT

Broders, A. C.: *Tuberculosis of the Stomach, with Report of a Case of Multiple Tuberculous Ulcers*. *Surg., Gynec. & Obst.*, 1917, xxv, 499.

The author reviews the entire literature on the subject, giving a bibliography. He reports a case and reaches the following general conclusions.

1. Little was known of gastric tuberculosis before the middle of the nineteenth century.

2. Gastric tuberculous lesions have practically the same gross and microscopic appearance as tuberculous lesions of the intestines.

3. A specific reason for the relative immunity of the stomach to tuberculosis still remains unknown.

4. The gastric juice appears to have a very slight effect on the tubercle bacillus unless the contact extends over a period of at least twelve hours.

5. It is possible to produce gastric tuberculosis experimentally.

6. The exact mode of infection is often difficult to determine.

7. The theory that gastric tuberculosis is always secondary to intestinal tuberculosis has been disproved.

8. About half of the cases reported as gastric tuberculosis should be classified as doubtful or rejected.

9. Adults are affected more often than children, the ratio being about 3 to 1.

10. Males are affected more often than females, the ratio being about 2 to 1.

11. Ulcer is the predominating lesion in the positive and probable cases, constituting 81.6 per cent of the former, and 80.5 per cent of the latter.

12. The lesser curvature is the most frequent site of the ulcer or ulcers in the positive cases, the pylorus in the probable cases and in a combination of the positive and probable cases.

13. In tuberculosis of other organs associated with gastric tuberculosis, the lungs take first place, closely followed by the intestines.

14. No case of tuberculosis of the stomach has been absolutely proved to be primary in the stomach.

EDWARD L. CORNELL.

Carman, R. D.: *Roentgen Diagnosis of Concurrent Gastric and Duodenal Ulcer*. *Am. J. Roentgenol.*, 1917, iv, 552.

The author calls attention to the frequent concurrence of gastric and duodenal ulcer and the possibility of discovering both conditions in a given instance with the roentgen ray. Of 16 patients found at operation in the Mayo Clinic during 1916 to have such a double lesion, 7 had the condition diagnosed before the operation by the roentgen

examination. The presence of a "niche" in the gastric contour which is pathognomonic of gastric ulcer, and either a coincident definite and constant bulbar deformity or the combination of gastric hyperperistalsis with a six-hour retention, which are safely diagnostic of duodenal ulcer, indicate the existence of a double lesion. In some cases definite signs of one or the other condition are lacking and findings common to either lesion alone may render correct interpretation extremely difficult.

Case histories of two typical cases with roentgen photographs are given and several other cases are illustrated. In view of the fact that a purely clinical diagnosis is obviously not feasible in such cases, the roentgen examination must be depended on largely in establishing the presence of the condition.

ADOLPH HARTUNG.

Castex, M. R.: Syphilis in the Etiology of Gastric and Duodenal Ulcer (*La sífilis en la etiología de las úlceras gástricas y duodenales*). *Prensa méd. argent.*, 1917, IV, 194.

Castex says that modern authors give little heed to lues in the etiology of gastric and duodenal ulcer. Within the past few years he has had the occasion of observing certain cases of gastric and duodenal ulcer and has become convinced that the larger percentage of gastroduodenal ulcers have a syphilitic etiology. The clinical histories of these cases are given and generally show that the ulceration yields to an antisyphilitic medication. The author agrees that a causal treatment is the only one capable of effecting a radical cure of gastroduodenal ulcer.

W. A. BRENNAN.

Rachford, B. K.: Pyloric Stenosis in Infancy. *Arch. Pediat.*, 1917, XXXIV, 803.

Rachford reports operations for pyloric stenosis on three infants between the third and seventh weeks after birth and makes certain deductions as to the etiology of this condition.

In the first case a gastro-enterostomy was done; the pylorus was not explored because of the precarious condition of the infant. In the other two a Rammstedt operation was performed; in this the circular fibers of the pylorus were severed. All three cases recovered. At seven and a half months the second case died from an enlarged thymus as demonstrated at autopsy. The third case later suffered from thymic disease which disappeared under X-ray treatment.

Palmer in a recent paper called attention to the frequent association of enlarged thymus and pyloric stenosis.

Examination of the second and third cases showed that following the Rammstedt operation the pylorus functionates normally and it is the author's belief that it is also much safer and more simple than the gastro-enterostomy operation. His observation is that in the majority of cases pyloric stenosis in infancy is due to an increase of the circular muscular fibers due to excessive muscular

action of some unknown cause and is not congenital, as after the Rammstedt operation the hypertrophied muscle entirely disappeared in a few months.

The term congenital hyperplastic or hypertrophic stenosis is unwarranted in cases such as these. His experience leads him to conclude also that a large percentage of these cases get well under medical treatment if by this treatment the gastric and pyloric irritation is removed.

I. E. BISHKOW.

Apfel, H.: Intussusception; Its Early Recognition. *Arch. Pediat.*, 1917, XXXIV, 781.

In numerous cases cited from the literature it was found that those cases of intussusception which recovered were operated upon within forty-eight hours from the time of appearance of symptoms. Cases operated upon in the first twenty-four hours gave a mortality of 10 per cent, while the average was 50 per cent.

Wallis says: "I have long been of the opinion that methods for reducing the intussusception, such as gas, air, etc., should not be attempted and should not be taught to students."

The author makes a plea for early operation in this distinctly surgical lesion, as the mortality in the exploratory operation is practically nil as compared to the high rate when one waits for the appearance of the classic tumor. Too long a delay, attempting mechanical reduction, gives time for swelling and edema, for adhesions to form and for perforation and peritonitis to take place.

In an infant with suspicious paroxysmal vomiting and pain, frequent examinations should be made.

The author reports a case in an infant 9½ months old. There was a previous history of pertussis, but no other illness until eleven o'clock on the night of the attack, when vomiting started and continued repeatedly until two o'clock. This ceased after the mother administered an enema of soap suds. Two hours later the vomiting recommenced; an enema had no effect. The child continued to have paroxysms of pain and vomiting. The mother attributed the sickness to the feedings. No fever was present, the pulse rate was not increased, there was slight rigidity of the neck, and few râles present.

Differential diagnosis suggested: (1) acute intestinal obstruction; no diarrhoea was present; (2) acute gastritis; (3) meningitis; (4) acute appendicitis.

During the vomiting paroxysm two peristaltic waves were noted, one in the lower abdomen, the other in the upper. There was no tumor. No blood was passed until just before the operation. An ileocaecal intussusception was found, which was reduced without difficulty, and the child made a rapid recovery. Operation was performed nine hours after the onset of symptoms. C. A. BOWERS.

Jackson, W. R.: Diverticulitis of the Cæcum. *N. Y. M. J.*, 1917, CVI, 818.

The author states that diverticula of the intestines are both congenital and acquired. The

sigmoid is more often affected, while diverticulum of the small intestine, Meckel's diverticulum, is rare. Multiple and small diverticula are often seen in the descending colon and sigmoid.

Diverticula vary in size from a grain of wheat to a hazelnut or larger and they may contain concretions and fecal matter. They occur in the old more often than in the young and are prone to inflammation, like the appendix.

The most frequent cause of the acquired type is constipation in patients whose intestines have markedly weak spots where the vessels penetrate its walls. Obesity appears to be a causative factor also.

The presence of diverticula may lead to obstipation, pocketing, ileus, inflammation, gangrene, ulceration, perforation, vesicocolic fistula, and thrombosis. Diverticulum of the caecum when inflamed will produce symptoms of appendicitis, and it is impossible to differentiate it.

Chronic diverticulitis may become a focus of an extensive fibrous area, or "fibromatosis," resembling carcinoma, and often is diagnosed as such. Pain, tenderness, rigidity of the abdominal muscles, constipation, tympany, nausea, vomiting, fever, swelling and leucocytosis constitute the syndrome of diverticulitis.

The following conditions are to be differentiated from diverticulitis: Left-sided appendicitis; tuberculous sigmoiditis; dysentery; leucic, actinomycotic and catarrhal sigmoiditis; pelvic inflammatory disease; carcinoma of the sigmoid.

Usually X-ray findings in colon diverticulum are very striking and positive. The case reported was a diverticulum of the caecum inflamed and gangrenous, and was the size of an apple, measuring three inches in diameter.

Speed, K.: Hematuria in Appendicitis. *Surg. Clin. Chicago*, 1917, 1, 1007.

The causes of appendicular hematuria may be briefly outlined as follows:

1. Local: (a) Peri-ureteritis in the appendiceal area; hyperemia of mucosa with blood leakage into the urinary stream; (b) true ureteritis from direct extension; the appendix chronically adherent to the ureter or ulcerated into the ureter by an abscess or intense neighboring inflammation; (c) pericystitis; the appendix near the bladder wall. Same pathology as (a); (d) true cystitis from extension as in (b).

2. General; dependent on the appendicular inflammation: (a) Septic infarcts in kidney, ureter, bladder, or prostate; (b) toxic hematuria; (c) lighting up of old urethritis or cystitis by acute febrile attack.

Any of these causes may act. The author believes that the majority of the instances of bloody urine in appendicitis can be traced to the local peri- and true ureteritis. Most of the patients reported were not intensely toxic. Only one had suffered from recent urethritis, and the appendices were mostly deep and adherent over the ureteral course. Several

patients had masses of abscess or inflammation palpable through the rectum, some with an appendix adherent to the bladder wall, but all without hematuria. Not one of this series of seven patients gave evidence of septic kidney infarcts, and in one cystoscopically examined the bladder mucosa was normal. The prompt recovery after appendectomy proves rather conclusively that local ureteritis is the cause of most of these attacks of hematuria accompanying appendicitis.

The diagnosis must consider, of course, kidney and ureteral stone and new-growths, cystitis and pericystitis, abscess rupturing into the bladder, stone and new-growths in the bladder, as well as prostatic, seminal, and urethral lesions. Cystoscopy is of great help.

I. S. KOLL.

Willits, E. K., and Judell, M. I.: Report of 44 Appendicitis Operations in Children Under Fourteen Years of Age. *Calif. St. J. Med.*, 1917, xv, 444.

The following deductions were made from 44 operations of appendicitis in children:

1. Delayed operations lead to abscess in the great majority of cases.
2. Cathartics are detrimental in nearly all cases.
3. More rapid recovery occurs when the appendix is removed in abscess cases.

The authors believe that the peritoneum of the child is more resistant to infection than that of the adult. Of the series of cases operated upon, 24 had abscess formation, while 14 were of the catarrhal. Complications and fatality could be avoided by early operations.

Rupture of the appendix occurred in the following sequence: 15 per cent when operated upon at the end of the 1st day; 10 per cent when operated upon at the end of the 2nd day; 25 per cent when operated upon at the end of the 3rd day; 15 per cent when operated upon at the end of the 4th day. For the most part rupture occurs in the first forty-eight hours, for the cases operated upon in the early stage showed small perforations, limited pus formation, and good general condition.

Early abscess formation is due to anatomical development of the child, as manifested by the following:

1. The appendix is located higher up in the abdomen, favoring general peritonitis.
2. The opening into the caecum is proportionately larger, permitting the entrance of feces and infectious material.
3. The abundance of lymphoid tissue predisposes to metastatic infection from tonsils, enteritis, and exanthemata.
4. The appendix is longer and the meso-appendix shorter, which favors kinking and circulatory disturbances.

The symptoms in this series were deceptive, because they did not supply an index of the seriousness of the pathological conditions and thus slight pain and tenderness were overlooked. At

first the pain was general and as a rule became localized later. Rigidity was found at times in the right upper rectus region, more frequently in the lower right; again in the lumbar region and only twice in the left lower rectus region. Vomiting was not always present.

The authors conclude that localized rigidity in any part of a child's abdomen is likely to be appendicitis. And in the words of Pfandler, the problem is not when to operate but when not to operate.

M. A. BERNSTEIN.

Williamson, G. M.: Carcinoma of the Colon. *J. Lancet*, 1917, xxxvii, 702.

The author restates the etiology and most frequent pathology of carcinoma of the colon and cites four cases which upon operation proved to be such. In all these cases the symptoms were vague and indefinite, consisting of some gastric disturbance, paroxysmal or persistent abdominal pain, constipation or diarrhoea; in three of the cases the diagnosis was first made on the appearance of a palpable tumor.

The prognosis is good for cases in which early diagnosis and proper surgical interference is made, as metastases and involvement of other structures occurs late.

H. H. FREILICH.

Yeomans, F. C.: Adenomyoma of the Rectum. *Tr. Am. Proctol. Soc.*, New York, 1917, June.

The following case appears to be unique:

A woman aged 37, the mother of two healthy children, was seen in consultation in September, 1916, for rectal hæmorrhage and pain. The important points of her history were: pulmonary tuberculosis contracted six years before and cured; painful menses, the flow diminishing; habitual constipation until three years ago. Then occurred an attack of diarrhoea lasting five months, and thereafter intermittent attacks. For the previous year ten or twelve movements occurred daily, containing blood and mucus. Pain over the sacrum was aggravated at the menstrual period and with the diarrhoea.

Physical examination showed the patient to be pale but well-nourished; weight, 142 pounds. A Wassermann test of the blood was negative. Urine was normal. Chest and abdomen were negative.

A rectal examination was made. Three and one-half inches up on the anterior rectal wall just above the cervix uteri was a hard fixed, fairly tender mass, the limits of which could not be defined. The proctoscope showed a superficial ulceration, the size of a quarter, at the rectosigmoidal juncture. This was red, clean, and bled freely on contact. Vaginal examination was negative except that in the posterior fornix was felt the same mass, apparently the size of a guinea-hen's egg.

The patient was operated upon in September, 1917. A left rectus incision was made. No growths were found in the liver or other abdominal viscera. The tumor was located in the anterior wall of the

sigmoid just above its juncture with the rectum and extended down two inches on the rectum, cervix uteri and posterior vaginal wall. The lower third of the sigmoid was mobilized including a small portion of the posterior wall of the uterus and its cervix, and the superior hæmorrhoidal artery was ligated. Then the abdominal wound was closed, and in a lithotomy position the operation was completed by extirpation of the rectum, including the posterior vaginal fornix. The patient reacted promptly from the immediate shock of the operation. The bowels acted on the third day, and union of the sigmoid to the peri-anal skin was primary except at one spot, which soon granulated. The patient left the hospital in three and a half weeks and is now well, having normal anal sensibility for bowel actions, which occur once or twice daily with normal control. Vaginal and rectal examinations show no abnormalities.

Interest in this and similar tumors in this location centers in:

1. Origin. Suggested origins are uterine mucosa, wolffian ducts and "embryonic rests persisting from the fusion of Mueller's ducts." The author's case was clinically an intestinal growth. Ewing, after careful study, reported "the most likely origin is from superfluous material derived from that portion of the lower gut which continues on in the embryo to the bladder and allantois, and which normally atrophies. Persistence of a portion of this segment would furnish a source of smooth muscle and intestinal epithelium." He does not think the tumor is of Muellierian origin.

2. Symptoms. Varying with the development and site of the growth, the symptoms would be obstructive, dysenteric or neuralgic.

3. Diagnosis. A tumor imparts a rather characteristic feel. It is apt to be mistaken for an infiltrating, inoperable, malignant growth.

4. Prognosis. Histologically it is benign. Clinically it may be malignant from the symptoms to which it gives rise, or may actually undergo malignant change.

5. Treatment. Surgical removal should take place at the earliest date possible. The abdominal route is preferable, but if the tumor is at the rectosigmoidal juncture, a combined operation will probably be necessary for its removal, as was successfully done in the author's case.

Drew, D.: Procidencia Recti and Its Treatment. *Lancet*, Lond., 1917, cxliii, 790.

The essential condition for the occurrence of procidentia, in the absence of any condition which drags or presses the bowel down, appears to be undue mobility of the rectum, either as a congenital defect or from stretching of the supporting structures.

Many operative procedures have been practiced for the cure of procidentia in the adult, and from their number and variation, apart from definite evidence of failure, it is suggestive that none of them

are very reliable in effecting a cure. Such methods as scoring the mucous membrane with the cautery or with a cauterizing acid are in no way curative and only cause additional suffering.

The inveterate cases are best treated by drawing down the prolapse to the fullest extent, excising a wide ellipse of the mucous membrane extending from the anal margin to the apex of the prolapse, and suturing the edges with catgut sutures which are embedded in the wall of the rectum so that, as they are tied, the rectal wall is pleated. The proctostoma is then pushed back and the bowels are kept confined for a few days, with precautions against straining when they are allowed to act. This operation, which is easily performed and entirely devoid of risk, is uniformly successful.

EDWARD L. CORNELL.

LIVER, PANCREAS, AND SPLEEN

Grober: The Treatment of Threatening Conditions in Hepatic Diseases. *Deutsche med. Wchnschr.*, 1917, xlii, No. 10.

Grober reviews the treatment of biliary calculi, acute yellow atrophy, etc., especially as regards medical treatment. He points out that operative intervention is dangerous to life even if skillfully performed. Biliary colic may subside spontaneously, while operation does not always succeed in freeing the patient from pain and other symptoms.

If operation is done it should be in an interval between acute attacks and not during an attack. If acute attacks are frequent, each time becoming more complex, the patient's decreased vitality and depleted condition usually urges him to accept the risk of an operation. Also when inflammatory symptoms point to a local purulent collection, the risk of a general infection is an urgent indication for operation.

W. A. BRENNAN.

Werellius, A.: Suction-Bulb Action of the Gall-Bladder. *Surg. Gynec. & Obst.*, 1917, xiv, 520.

Until recently the gall-bladder was universally considered a biliary reservoir. The relative disproportion between the quantity of bile secreted and the capacity of the gall-bladder, however, made such a theory untenable.

In an operation on a gall-bladder case, the author noticed that the liver in its respiratory excursions produced a mechanical passive contraction and relaxation of the gall-bladder. He noticed alternately a collapse of the fundus and a distention of the indented area, corresponding to the respiratory movement of the liver. This was easily proved by the introduction of a tube into the gall-bladder of a dog, connecting it with a mercurial manometer.

In order to register these pressure changes under as normal intra-abdominal conditions as possible, the tube from the gall-bladder may be carried through the rectum and anus and then attached to the recording apparatus. The gall-bladder and the liver-duct are arranged in exactly the same manner

as a stomach tube with its bulb. As there takes place an alternate contraction and relaxation of the gall-bladder, it is reasonable to assume that the same physical phenomena occur in the bile-outlet as in the manipulated stomach tube. During inspiration there is a decided increased pressure of the gall-bladder, and undoubtedly pressure in the common duct is a great deal less than in the bladder. Thus the bile is forced into the duct. As the least resistance of the flow is in the direction of the duodenum, the added impetus given by the emptying of the gall-bladder undoubtedly enhances the current in that direction.

During expiration the intracystic pressure is greatly lessened, and in fact, negative, and undoubtedly the pressure in the common duct is greater than in the bladder; consequently, the bile flows into the sac.

EDWARD L. CORNELL.

Cole, L. G.: Differential Diagnosis of Right Renal and Gall-Bladder Lithiasis. *Intern. M. J.*, 1917, xxiv, 946.

The author strongly emphasizes the importance of differentiating between these two conditions, noting the embarrassing position in which the surgeon is placed through having accepted an incomplete and erroneous finding by the roentgenologist. He states that approximately 20 per cent of gall-stones are of sufficient density to cast a shadow in a right kidney plate, and that 5 to 6 per cent contain calcium deposits in a sufficiently extensive and uniform degree to render differential diagnosis difficult.

Cole illustrates the difficulty in differentiation with two examples, one a right renal calculus, the other a gall-bladder calculus.

A series of eight pairs of plates is shown, each pair illustrating a right renal and gall-bladder calculus respectively. The various physical characteristics of the two conditions are as follows: (a) in renal calculus, (1) very dense; (2) usually single; (3) of uniform density; (4) if multiple, irregular in shape conforming to the pelvis and calices; (5) if multiple, varying in size and shape; (6) with surface usually rounded; (7) frequently branching; (8) seldom changing in position between examinations. (b) in biliary calculus, (1) soft or dense; (2) usually multiple; (3) of variable density; (4) if multiple, conforming to the shape of the dilated gall-bladder; (5) if multiple, relatively the same in size and shape; (6) with surface usually flat or faceted; (7) never branching; (8) frequently changing in position between examinations.

Cole mentions in addition several other points that are extremely helpful in reaching the correct conclusion, viz., shadows of renal calculi are sharper and smaller when the plate is posterior and the tube anterior. Biliary shadows are sharper and smaller when made with the plate anterior and the tube posterior. Plates made and viewed stereoscopically place the biliary shadows in the anterior plane and the renal shadows in the posterior plane. When plates are made in the lateral direction biliary cal-

culi shadows are seen in the anterior plane in front of the bodies of the vertebrae, while the renal shadows are seen in the posterior plane partially obscured by the bodies of the vertebrae. Any standard accurate method of localization will demonstrate the relation of either calculi to the anterior and posterior abdominal walls.

In conclusion the author mentions the use of pyelography to demonstrate the anatomical situation of a renal or ureteral calculus. He also recommends the use of a barium meal to demonstrate the anatomical situation of biliary calculus and to elicit the indirect evidence of this condition, such as spasm, adhesions and distortion of the cap. Adhesions are of as great clinical significance in the diagnosis as the detection of the biliary calculus itself.

W. HOWARD DICKSON.

Rosenbloom, J.: Certain Factors in the Etiology of Gall-Stones, on the Basis of Their Chemical Composition. *J. Am. M. Ass.*, 1917, lxi, 1765.

After a brief résumé of the causation of gall-stones in general, the author gives the results, in tabulated form, of the analysis of the gall-stones removed in 14 cases of diagnosed cholelithiasis. A careful history as to previous infectious disease was ascertained in each instance. In every case where there was a history of previous infection, the gall-stones removed were composed of calcium salts, while in those cases with no history of an infectious disease, the stones were composed of cholesterol.

The author's report confirms the previous reports of both Mignat and Rosenow, who have shown the relationship of infection to the formation of gall-stones, namely, that cholesterol stones have no relation to previous infection, while calcium stones usually follow upon a previous or an existing infection.

H. B. MATTHEWS.

Waller, E.: Idiopathic Choledochus Cyst. *Ann. Surg.*, Phila., 1917, lvi, 446.

Waller reports the case of severe cystic dilatation of the common duct in a ten year old girl with a history of recurrent attacks of abdominal pain about once a year since the age of three. Three days before her admission to the hospital there was a sudden onset of severe pain on the right side of the abdomen accompanied by vomiting. A mass about the size of a fist was found just below the right costal margin. There was slight icterus present.

Upon opening the abdomen the gall-bladder was found to be of normal size and appearance and contained no stones. The tumor which had been palpated before operation was found in the retroperitoneal tissues; at first it was thought to be a hydronephrosis, but upon exposure no connection was found with the right kidney. The thin-walled cyst contained about 200 ccm. of dark clear bile and the gall-bladder emptied into the upper part of the sac. At the lower pole of the cyst a small opening communicated with the retroduodenal

portion of the common duct. The cyst was apparently due to an enormous dilatation of the supraduodenal portion of the common duct. An anastomosis was made between the cyst and the duodenum. The patient recovered and was discharged about four weeks after operation.

The cyst had developed from the middle and upper part of the common duct. None of the usual causes of obstruction of the common duct in the form of stone, tumor, stricture or pancreatitis were found to exist.

The total number of cases collected by the author, including his own, is 35, in none of which the disease could be diagnosed clinically, and in most of the cases, not even at the operation. In one additional case was an anastomosis made primarily between the cyst and the intestine.

The condition is dependent upon a congenital anomaly in the course of the common duct. In most cases the cyst attained the size of a child's or a man's head, holding from 4 to 5 litres of fluid. The cyst usually lay below the liver, closely pressed below its lower surface. In some cases it had extended across the median line and even down as far as the pelvis, pushing the duodenum to the left. The biliary tract above the cyst showed but little dilatation, but the liver in the far advanced cases exhibited the appearance when enlarged of a biliary cirrhosis.

The principal symptoms produced by a choledochus cyst are icterus, tumor and pain; the tumor has usually been mistaken for an echinococcus, pancreatic or liver cyst. Suspicion should be aroused during the first two decades of life, especially in females, when a large cystic alternating swelling in the right hypochondriac region is found, more fixed than a distended gall-bladder, and associated with icterus, fever, and more or less violent pain.

In 21 of 30 cases in which operative measures were employed, the cyst was sutured to the abdominal wall. All of these cases ended fatally, with one exception; the patient died three years later of other causes. It appears that the anastomosis between the cyst and the duodenum is the only rational therapeutic means, and ought to be done primarily; the danger of infection of the biliary tract is not great.

The article concludes with a list of all published cases and a complete bibliography.

D. N. EISENDRATH.

Eisendrath, D. N.: Recurrence After Operations on the Biliary Passages. *J. Am. M. Ass.*, 1917, lxi, 1752.

The author calls attention to the causes of recurrence in operations on the biliary passages. These recurrences may be (1) true, and (2) false.

True recurrences are possible and are, no doubt, of frequent occurrence. Re-formation of stones after cholecystostomy by the persistence or recrudescence of infection lodged in the crypts or glands of Luschka has been proven beyond any doubt.

Whether or not true reformation of calculi takes place in the common or hepatic ducts is not known. Certainly there are well authenticated cases of intrahepatic cholelithiasis. Cases that present themselves for secondary operation with the presence of calculi in the gall-bladder or its ducts, when none were found at the primary operation, undoubtedly are cases due to the descent of intrahepatic calculi.

False recurrences may be tabulated as follows: (1) overlooked calculi; (2) adhesions; (3) chronic pancreatitis; (4) persistence or recurrence of original infection; (5) strictures; (6) fistulae; (7) faulty technique, i.e., in disposition of the gall-bladder and cystic duct; (8) incorrect diagnosis, as, for instance, tubercles and spinal tumors; (9) co-existence of two conditions, such as ureteral calculus; (10) contraction of the ampulla of Vater; and (11) cancer of the head of the pancreas. Of all these, persistence of infection, overlooked calculi and chronic pancreatitis constitute the majority of the causes of recurrence. Undoubtedly the persistence of infection and overlooked calculi constitute the most common causes of recurrence. Intrahepatic cholelithiasis must certainly play a very important rôle in the causation of recurrences, for if such a condition exists, the futility of locating every small calculus lodged in each hepatic duct is at once apparent. Faulty technique is, no doubt, responsible for many recurrences. When only cholecystotomy is performed, the bladder, after the drain is placed in the fundus, had better be dropped back and not anchored to the parietal peritoneum. The cystic duct should be removed close up to the common duct, for if left long, its distal end becomes dilated to form a new gall-bladder which may, and often does, contain calculi.

The author gives in detail his technique of choledochostomy, supraduodenal, illustrated by excellent black and white sketches. The T drainage tube from the common duct, as used by the author, is the same as originally recommended by Kehr and Deaver.

There is appended a list of 13 cases of secondary operations for recurrences performed by the author.
H. B. MATTHEWS.

Schell, J. T.: Acquired Syphilis of the Pancreas.
Am. J. Surg., 1917, XXXI, 259.

The author calls attention to the fact that syphilis of the pancreas is not always congenital, but may be acquired with the characteristic symptoms of dyspepsia, wasting, and fatty stools, often jaundice if the head of the pancreas be involved, tenderness in the region of the pancreas, and evidence of syphilis in other organs. He cites an interesting case of a trained nurse who first consulted him for pain and tenderness in the region of the pylorus or pancreas. She had nausea, some vomiting, loss of weight, and pain in the abdomen, especially at the time of bowel movements. Stomach analysis was negative, except for some occult blood.

The appetite was good; burning and pain in the stomach were relieved by food. There were also present some pelvic conditions such as backache, leucorrhœa, and irregular menstruation.

An exploratory laparotomy was performed, which failed to reveal the cause of the pain. There was evidence of previous pelvic peritonitis; the appendix was bound down and retrocaecal, and was removed. The head of the pancreas at that time was found quite hard and somewhat enlarged. The patient apparently improved for a few months, then became gradually worse again, this time showing some jaundice. It was then thought possible that cholangitis was present, or a common duct, and a second operation was performed. The gall-bladder emptied poorly and the pancreas was found larger than at the first operation and still hard. A diagnosis was, therefore, made of chronic interstitial pancreatitis with cholangitis. The gall-bladder was drained at this operation.

Six months later the symptoms recurred as severely as at first. It was then discovered that eight years before, following a syphilitic maternity case, she had developed a small sore on her finger which was slow in healing, followed by skin eruption and sore throat. A Wassermann test was taken and found positive. A course of anti-syphilitic treatment was given, following which all symptoms disappeared. She gained weight and was apparently well.

The author urges that routine Wassermann tests be taken on all obscure gastro-intestinal cases, as he has had several other similar cases clear up under specific treatment.
L. H. HILL.

Lefèvre: Traumatic Rupture of the Spleen: Splenectomy; Recovery (Rupture traumatique de la rate; splénectomie, guérison). *Presse méd.*, Par., 1917, p. 613.

The patient in the case reported by Lefèvre fell over an obstruction. He got up and walked a few steps, but was attacked by sharp pains in the left thoracic base region and was assisted to the hospital. On examination his pulse was only slightly weakened, and the abdomen relaxed except just beneath the left costal border where there was some slight resistance. The pains continued and became more violent. Later his appearance grew worse and the abdomen became rigid. A diagnosis of intraperitoneal hæmorrhage probably due to rupture of the spleen was made, and the man was operated upon.

The abdomen was full of blood. The spleen was easily exposed. It was separated into two distinct parts by a rupture perpendicular to its major axis. The pedicle was ligatured and the splenic cavity cleaned out. Drainage, closure and intravenous injection of physiologic serum was done. The postoperative course was simple. Examination showed that the rupture was at the union of the anterior and middle thirds; the capsule was largely denuded for an extent of about 3 cm.

The author thinks that this rupture occurred in

two stages: first, that there was a parenchymal rupture with intrasplenic hæmorrhage and formation of a subcapsular hæmatoma; then upon an effort capsular rupture and peritoneal inundation.

W. A. BRENNAN.

Ganguli, H. K.: Death from Rupture of the Spleen Twenty-Five Days After Abdominal Injuries and Apparent Recovery. *Indian M. Gaz.*, 1917, li, 399.

The patient showed three incised wounds, small and slight, in the leg, hand, and head. Two small ecchymotic spots were found over the pit of the stomach and to right of the umbilicus. The abdomen, especially about the ecchymosed spots, was very tender, distended, and an intense abdominal pain was present. Cardinal symptoms of shock were noted.

The symptoms of shock subsided and symptoms of peritonitis set in. The abdominal pain diminished, but the patient complained of a swelling in the splenic region tender to the touch, where he had been struck with a stick.

By the nineteenth day in the hospital all symptoms subsided and he was discharged. Nine days later he experienced sudden and severe abdominal pain and died soon afterward.

Postmortem examination revealed two to three pints of blood in the abdomen, showing a rupture of the spleen at the hilus. The spleen was softened. A history of recent fever led the author to believe that was the cause of the splenic softening which favored rupture when the organ was traumatized. He believes that at the time of injury the hæmorrhage must have been within the spleen and ruptured into the abdominal cavity on the day death occurred.

I. E. BISHKOW.

MISCELLANEOUS

Eastman, J. R.: Abdominal Wounds in War. *J. Indiana St. M. Ass.*, 1917, x, 417.

The present war has witnessed important developments in the treatment of gunshot wounds of the abdomen. The old plan of "rest and opium" still has many advocates, but the weight of opinion is in favor of immediate operation wherever possible. A skilled operator, trained assistants, a sufficient armamentarium and an aseptic environment are all necessary. Furthermore, before celiotomy is performed the following points must be considered: diagnosis, length and character of transportation to bring the patient to the place of operation, the time interval between the injury and operation, the time the patient will be able to stay at the place of operation before evacuation to a base, and also the question whether or not time can be given to operation without neglect of the other wounded.

The author classifies gunshot wounds of the abdomen into two types; the first includes abdominal wounds down to and through the peritoneum

but without injury to the viscera, and the second or more serious type includes all injuries to the abdominal organs. Attention is called to the fact that a distended hollow viscus is apt to be ruptured by the impact of a bullet on some distant part of the body; for example, the rupture of a full stomach by the impact of a bullet on the pelvis.

The general symptomatology is practically as in civil life. Injuries of the stomach are of more frequent occurrence. Attention is called to the phenomenon that the outpouring of gastric contents is usually into the lesser peritoneal cavity even though both anterior and posterior perforations occur. Little value is attached to the symptoms of hæmatemesis, as it is rarely present. The small intestine, of all hollow organs, is the most frequently perforated. The injuries are usually multiple, varying from small round perforations to complete division of the gut. The teaching that a mucous membrane plug is forced into the wound of the muscularis and serosa and thus prevents the extrusion of intestinal contents into the peritoneal cavity with subsequent peritonitis is false.

In small perforations a single purse-string suture of silk or linen is used, while in ragged, long wounds a running stitch is best. A lateral anastomosis is preferred in most instances to the end-to-end method. Infection from injury and escape of contents from the large gut are more serious than when the small intestine is perforated. Extraperitoneal wounds of the rectum nearly always recover eventually, but intraperitoneal injuries are very serious.

Owing to their small size, the kidneys are not very frequently wounded, and when this occurs they are usually accompanied by wounds of the small intestine. The injury to the kidney itself should be treated conservatively. Extensive hæmorrhage occasionally necessitates a nephrectomy, but as a rule the "rest and opium" treatment is the best. Intraperitoneal wounds of the bladder require abdominal operation; where this is not possible, a retention catheter.

The chief sequel to wounds of the liver is hæmorrhage. This often subsides spontaneously, or if necessary, may be controlled by means of packing. Suturing usually produces additional hæmorrhage. Wounds of the spleen are rare, and the hæmorrhages as a rule are not severe. Pancreas wounds are usually complicated and offer a very bad prognosis.

R. B. BETTMAN.

Miginiac: Penetrating and Non-Penetrating Abdominal Wounds (Observations de plaies de l'abdomen pénétrantes et de non pénétrantes). *Bull. et mém. Soc. de chir. de Par.*, 1917, aliii, 1832.

The cases reported include: 35 laparotomies; 10 Murphy operations; 8 wounds, operations not advised; 14 inoperable wounds; 31 non-penetrating wounds; 1 secondary operation, making a total of 99 cases.

The non-penetration in some cases was only determined after laparotomy.

The 10 cases in which a Murphy operation was

done all ended fatally. The operation was done relatively early and without signs of peritonitis in 4 cases; it was done with signs of peritonitis in 6 cases.

Short histories of the 31 laparotomies are given. These resulted as follows: 8 laparotomies for simple non-visceral penetrating wounds gave 5 deaths, 3 recoveries; 17 laparotomies for univisceral lesions gave 15 deaths, 2 recoveries; 5 laparotomies for multivisceral wounds gave 5 deaths, no recoveries.

Five wounds of the liver gave 4 deaths; 4 wounds of the small intestines gave 4 deaths; 7 wounds of the large intestine gave 4 deaths. According to the history the interval between injury and operation varied from 3 hours to about 17 hours.

W. A. BRENNAN.

Jackson, R. W.: Adult Rectal Prolapse; Two Cases and a Contrast. *Tr. Am. Proctol. Soc.*, New York, 1917, June.

Too few papers have appeared from the pens of proctologists on the major types of rectal prolapse. The subject deserves more attention. Two sharply contrasting cases bring out the author's views on the therapy.

The first case was operated upon four times: extensive regional cauterization, resulting in recurrence; posterior rectopexy resulting in recurrence; amputation, resulting satisfactorily as regards anal prolapse, but leaving a very large posterior vaginal hernia, which was promptly cured by cul-de-sac closure with sigmoid-utero-ventral wall suspension.

The second and less favorable case was promptly cured by one operation identical with the final operation in the first case.

The pelvic floor as a support depends on the sufficiency of four factors. The pelvic fascia is variable in strength and attachments, varying the depth of the peritoneal cul-de-sac. The strength of the levators and their uplift is not a constant thing. The anal and vaginal orifices may be guarded by sphincters, perivulvar muscles, a perineum and levators which are imperfect through trauma or atrophy. An amount of adipose padding about these structures is essential but often lacking. The rectum has imperfect support above the pelvic floor and its anterior wall none at all.

Prolapse begins here from external pressure, or begins below as anal protrusion, but eventually the prolapse contains a hernial cul-de-sac. Regional cauterization is inadequate to meet any such faults. Posterior rectopexy does not support the primarily offending part. Amputation removes the troublesome part but does not correct the faulty factors which may allow recurrence per anum or per vaginam. Cul-de-sac closure, though a difficult operation, goes far toward such correction, and suspension helps.

The author concludes that the operation of first choice for these prolapses is cul-de-sac closure through the abdomen, plus some form of suspension, to be followed and supplemented, if need be, later by amputation or perhaps some plastic work on the elements of the pelvic floor.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Hoffman, G.: Chronic Bone Suppurations. *Deutsche med. Wochenschr.*, 1917, xlii, No. 10.

Hoffman refers to the difficulty in treatment of chronic osseous suppurations following gunshot fractures. The cause is due to some cavity covered with granulating tissue but enclosing sequestra or free bone fragments. These free fragments cause constant irritation of the granulation process and give rise to active secretion of pus and fistulous tracts.

Hoffman describes the advantages of roentgenographic diagnosis. He has used Holzknecht's method in many cases very satisfactorily. But the best and most accurate results are obtained from stereoscopic plates; these give the best indications of the route to be followed in order to reach the focus of suppuration in the bone.

Experience has shown that sequestra can be removed "physiologically," as Klapp expresses it. The author holds that the bone chips and sequestra

in a cavity covered with granulating tissue can often if not always be extracted without interfering with or injuring the granulating tissue more than is absolutely necessary in order to remove the bone which covers the cavity. After this necrotomy there is no elevation in temperature. The lesion not deprived of its natural protection heals and the chronic suppuration of the bone ceases, while those cases in which the granulations are more or less severely injured or extensively removed are exposed to a new infection.

W. A. BRENNAN.

Delorme, E.: Decalcification Consecutive to War Traumatism (De la décalcification consécutive aux traumatismes de guerre). *Arch. de med. et pharm. mil.*, Par., 1916, lvi, 1.

Delorme points out that osteoporosis which obtains a good deal of attention in industrial accidents and their consequences has not received much attention as one of the complications of the traumatism of war.

In this article Delorme makes a thorough study of the subject. Chapters are devoted to its frequency in the various kinds of wounds, the ap-

proximate time of its appearance and duration, its specific characteristics, pathogenesis and treatment, and the temporary or definite disturbances which it may cause in the functioning of wounded limbs.

An examination of 204 radiographs has shown that in lesions of the upper limb, osteoporosis occurs in about two-fifths and in the lower limb in about one-third of the cases.

A further examination of 1,350 radiographs examined according to the bone attacked shows that in injuries of the radius the proportion of cases of osteoporosis is more than one-half. In other bones the proportion is even as high as two-thirds. The details of a large number of cases of upper and lower limb injuries are given.

From a general discussion of the subject based on his large experience Delorme finds that the solidity of osteoporotic bones in the wounded is not notably compromised and that osteoporosis is not a counter-indication to the orthopedic mobilization of joints.

Regarding conditions which offer an obstacle to direct treatment of pseudarthrosis Delorme is not so certain; but his present knowledge leads him to recommend either late operation of pseudarthroses after disappearance or evident modification in the osteoporotic process; or rather, before the appearance of marked osteoporosis, when suppuration has ceased, because osteoporosis itself may be late.

W. A. BRENNAN.

Mori, A.: Osseous Neoformation Consecutive to Multiple and Repeated Contusive Trauma (Delle neoformazioni ossee consecutive a traumi contusivi multipli e ripetuti). *Gazz. d. osp. e d. clin.*, Milano, 1917, xxxviii, 637.

In 1911 the author published an article in which he showed that the morphological and histological alterations due to auto-contusions, as far as studied, were limited to the skin and subcutaneous tissues, forming the clinical entity known as *edema duro*. However, if the cutaneous and adipose tissues are those which in the majority of cases feel the modifying effects of contusion, this does not exclude the presentation of important modifications in other tissues. The author has met some cases of bursitis, tenosynovitis and periosteitis.

Osseous neoproductions are the least frequent and their existence is even denied by some. In a long experience with industrial accidents the author has seen only three such cases. He gives the details of these cases. In one there was neoproduction of an osteoma after a slight contusion with abrasion of the right leg in an industrial accident. The other two cases were in soldiers who showed after simple contusions osseous neoformations at the site of injury.

These three cases and some other cases of occupational osteomata which the author quotes from literature confirm his previous statements that cellular dermatitis is not the only clinical and anatomic-pathologic expression of repeated multiple traumatic contusions, but that these mechanical stimuli

can cause other neoformative productions constituted from the connective tissues.

The author discusses the pathogenesis of these neoformations and leans towards the metaplasia theory.

W. A. BRENNAN.

Trutlé de Vaucresson: Clinical and Therapeutic Study of Late Bone Infections Consecutive to Gunshot Wounds (Considérations cliniques et thérapeutiques sur les infections tardives des os consécutives aux blessures par projectiles de guerre). *Arch. de méd. et pharm. mil.*, Par., 1916, lxx, 59.

The author has personally operated upon 350 cases of bone injuries in base hospitals; and as a result of this extensive experience he gives the progress and treatment of late infections in bones.

He summarizes his observations as follows:

1. In gunshot wounds of the bones there are late infections which have the greatest analogy to prolonged osteomyelitis and which can only be considered as a traumatic variety of this prolonged osteomyelitis.

2. Clinically such lesions are not marked by any striking symptoms but a simple fistula which leads to a bone much increased in volume, the interior of which shows by radiography an abnormal clear zone.

3. From the anatomicopathologic point of view the lesions are characterized by a fistulous bone cavity in the center of which the bone tissue is soft and in course of necrosis; the periphery shows a zone of rarefying osteitis; the whole process is limited by a concentric layer of osteitis which acts as a protection and limits the infection.

4. Treatment of the lesions consists of making large openings throughout the cavity and transforming it into an open canal after removal of all diseased bone. Further treatment consists in dressings and in energetic treatment of the wound in order to favor cicatrization. Recovery is slow, but definite; it may probably be effected in less time by artificial aseptic filling of the empty cavities.

W. A. BRENNAN.

Taylor, K., and Davies, M.: Persistence of Bacteria Within Sequestra. *Ann. Surg.*, Phila., 1917, lxxvi, 522.

The authors, of the American Red Cross Hospital, Paris, state that the treatment of the old suppurating fracture, resulting from a shell or rifle-ball wound, offers one of the most difficult problems in the base hospital and that there is probably no other form of injury which withholds from active service such a large number of men for such a long period of time. For this reason they have deemed it advisable to publish the incomplete data so far at hand resulting from investigation of the bacterial flora of these wounds. These data include observations on the persistence of various bacteria within the wounds and especially within the bone itself; the recrudescence of infection following operations on a septic field, commonly called a

"flare", the possible reaction of anaerobic bacilli to this recrudescence of infection.

For this study sequestra from a continuous series of secondary operations on suppurating compound fractures were examined. The cases were chiefly fracture of the long bones, which had reached the stage of bone sinuses, or, in two instances, were completely closed but showed sequestra on X-ray examination.

To determine whether there was any difference between the flora of the wound itself and the flora within the sequestrum the following technique was employed: To determine the flora of the wound, the sequestrum was placed in sterile saline solution and well shaken. The resulting emulsion was inoculated into deep agar, upon agar plates, into anaerobic broth, into meat culture medium, and into milk. To determine the flora with the sequestrum, the sequestrum was removed from the saline emulsion, dried and sterilized, by being dipped into alcohol and flamed. It was observed that certain organisms were obtained more frequently from the interior of the sequestrum than from the emulsion containing the wound flora. It was noted that each group of organisms was recovered more frequently from the sequestrum than from the wound, suggesting a richer flora within the former. One point, however, is evident, and that is the greater incidence of the anaerobic group within the sequestrum. Gas-forming anaerobes developed nearly four times more often from the bone than from the wound, while spores were present six times more often. In no case were gas- or spore-producing anaerobes recovered from the wound when not recovered from the sequestrum removed from it. The bone itself appears to be the most common site for the persistence of the anaerobic flora.

They state that the persistence of bacteria for such a long period within the bone is probably due to the mechanical protection afforded by the dense structure of the bone itself for organisms present within its spaces and canaliculi. Furthermore, the bacteria are protected from any antiseptic which may be introduced into the wound. The presence of organisms within the dead bone rather than in the soft tissues is probably the cause of the persistence of the sinus and the occurrence of the acute recrudescences of infection or "flares" after secondary operative procedures. Growth was obtained from sequestra removed from two cases in which the sinus had been completely closed for two weeks or more. This persistence of bacteria shows the necessity of caution in undertaking at an early date operations such as bone grafting or nerve sutures, where asepsis is a primary necessity.

The cases classified as "flares" are those which showed a rise of temperature within 24 hours of the operation sequestrectomy, amounting to one degree or more of fever, continuing for 48 hours or longer, and associated with a local inflammatory reaction about the wound.

They summarize their work as follows:

1. Aerobic or anaerobic bacteria invade the bony substance of nearly all sequestra and remain there as long as the sequestra persist.

2. Gas-forming, spore-bearing anaerobic bacilli, usually the *Bacillus aerogenes capedatus*, *Bacillus malignans oedematis* and *Bacillus Hibler IX* types, persist longer within the bone than in the wound about it. They were never recovered from the wound when absent in the sequestra. Neats of these anaerobes may persist for some time after the wound is completely closed.

3. Anaerobic bacilli are probably active factors in the disintegration of sequestra within the wound.

4. Anaerobic bacilli within the dead bone appear to be associated with the occurrence of "flares" after operations on bones.

5. Flares occurred more frequently after sequestrectomy when the cases were over 120 days old than when the cases were under that age.

6. It is probably impossible to kill by antiseptic treatment the bacteria within the dead bone. The object of treatment must be to remove this focus of infection. The sequestra may be extracted by operation, or their disappearance hastened by utilizing the solvent action of acid dressing solutions.

7. The persistence of bacteria within the bone probably explains the infection which often follows bone grafts in old compound fractures and indicates the advisability of postponing that operation as long as practicable.

G. W. HOCHREIN.

Brickner, W. M.: Pain in the Arm: Subdeltoid Bursitis; a Further Study of Its Clinical Types, Pathology and Treatment. *J. Am. M. Ass.*, 1917, LXIX, 1237.

Brickner considers subdeltoid bursitis to be the most common cause of pain in the arm and sometimes, but by no means always, also in the shoulder.

He believes that the immediate cause is traumatic, usually a squeezing of the supraspinatus tendon, occasionally the infraspinatus, and the bursa between the acromion process and the greater tuberosity of the humerus when the arm is abducted, although the history of injury or of muscular violence is often unobtainable. Often this injury occurs from a fall on the outstretched arm, but more often it occurs from internal violence, such as in raising the arm to beat a rug, hanging from a car strap, etc. This squeezing of the tendon is easily demonstrable at operation or on the cadaver. Small fractures of the greater humeral tuberosity are probably also associated with inflammation of the overlying subdeltoid bursa. He believes there is another etiologic factor, the associated subbursal deposit of lime and other mineral salts in or on the supraspinatus or the infraspinatus tendon. In his experience the condition occurs only in adults between the ages of twenty and sixty-one. His work has shown that it is neither infectious nor toxic in origin, because the specimens removed at operation in both acute and chronic cases have been sterile.

In the 18 cases he has operated upon he has

found the same lesion in the bursa, adhesions between its two walls. In most cases he has found no fluid accumulation in the bursa. Probably there is always a serous effusion at the outset, but it usually soon disappears. The lime deposit lies under the bursa and not in it or in its walls.

The symptoms are two: pain, and disability in shoulder movements. The pain is usually referred to the upper arm, anteriorly or externally, from the level of the deltoid insertion toward or to the elbow. Sometimes it radiates into the forearm, hand, fingers or neck. Disability of movement may be entirely absent even in chronic cases. The interference with internal rotation may be very great or moderate; the patient may be unable to put his hand in his trousers pocket or unable to reach behind his back. External rotation is usually little affected. There is no ankylosis.

In most cases when the patient is examined there is no swelling. There is often to be noted a flattening due to atrophy of the deltoid. The supraspinatus and infraspinatus muscles may also be atrophied. Pressure on the bursa below the tip of the acromion process is sometimes painful, but it is usually painless. If the X-ray is negative, it rather supports the diagnosis.

The author considers Vodman's classification of acute or spasmodic, subacute or adherent, and chronic or non-adherent, as unsatisfactory. In his experience the cases present themselves in the forms of acute, hyperacute, chronic, and chronic with exacerbations.

In the treatment his first object is to overcome the adduction disability, the spasm, if present, and thereby the pain. This he does by a simple automatic abduction. He puts the patient to bed supported on several pillows and with his arm raised as far as he can comfortably abduct it. A towel or bandage sling is passed from the wrist or elbow to the head of the bed and this end of the bed raised on blocks or chairs. As he gradually slides down in bed his arm correspondingly goes up. Sometimes the pain disappears within twenty-four hours.

Brickner believes that most patients who have subdeltoid bursitis recover under this plan of treatment in bed with automatic abduction, or the trouble subsides spontaneously, though slowly. He advises operation in the following cases: first, the chronic forms with exacerbations; second, the acute, hyperacute, and chronic cases in which the automatic abduction in bed fails to restore function and to relieve pain and spasm.

The operation he employs consists in splitting the deltoid, raising the outer wall of the bursa from the inner and incising it, dividing all adhesions in the bursa, incising and retracting the floor of the bursa, removing the deposit if extratendinous and suturing any tear in the supraspinatus tendon, or incising the tendon wherever indicated by the X-ray and excising the deposits with surrounding tendon fibers, reuniting the tendon with chromicized catgut if the defect is not too large, suturing the floor of

the bursa with a fine running catgut stitch, anointing the interior of the bursa with a thin layer of petrolatum, suturing the outer wall of the bursa, suturing in layers without drainage the deltoid muscle, the deltoid fascia and the skin, and abducting the arm in plaster of Paris for a week.

All patients thus operated upon have been promptly relieved of pain and early restored to full activity. In only one patient was there any complication; this was a brachial phlebitis, which retarded recovery a few weeks. G. W. HOCHREIN.

FRACTURES AND DISLOCATIONS

Taylor, H. L.: Fractures of the Neck of the Femur in Children. *N. Y. St. J. Med.*, 1917, xvii, 508.

In addition to the slipped femoral epiphysis in adolescents there occurs, with a frequency to demand recognition, a fracture of the neck of the femur in children under thirteen, of which Taylor reports seven cases. The fracture is a transverse fracture at the base of the neck, with an angular displacement in adduction, with or without rotation. Taylor proposes the name of "hinge fracture," since the periosteum under the neck does not give way, acts as a hinge, and allows angular adduction deformity but not mass displacement. This displacement, if marked and uncorrected, will give a permanent coxa vara deformity.

Treatment is by abduction, and a plaster-of-Paris spica from toes to axilla. H. B. LODGE.

Cohn, I.: Some Facts About the Repair and Treatment of Fractures. *N. Orl. M. & S. J.*, 1917, lxx, 419.

The periosteum is a fibro-elastic membrane which protects bone, gives additional nutritional supply and acts as a natural splint after fractures. The periosteum does not contain osteoblasts. Bony defects are repaired in the absence of periosteum as well as if it were retained. Persistent localized pain is one of the best evidences of fracture. In order to obtain good results, anaesthesia, immediate reduction, immobilization, and careful after-treatment are imperative. Attempts at reduction which are not along anatomical lines will not reduce deformity. Traction should be in the direction calculated to oppose the muscles producing the deformity.

The idea of waiting for the swelling to subside before reduction is attempted should be relegated to the historic past. Immediately after accident the callus-forming elements are most active, the muscle contraction is then spasmodic, but later amounts to a real contracture. Moreover, during a delay the ends of the bone may become covered by a new connective tissue membrane which in itself may produce delayed union. Nothing can be worse than prolonged complete immobilization.

As a sequel to the dissatisfaction over results obtained in fractures, came Champagniere's method of mobilization and massage. According to Groves,

the first duty is to secure accurate anatomical form and the second is to maintain proper healthy muscular nutrition and exercise. Excessive motion following fracture, particularly in the neighborhood of a joint, favors an excessive callus formation which will lead to ankylosis. The mobilization Champoussiere speaks of is not forced activity but one single painless motion. By massage is meant a light, stroking, rhythmic motion. Sepals is fatal to operative work in fractures. This should be kept in mind, especially in regard to gunshot fractures.

R. B. BETTMAN.

Trethowan, W. H.: The Functional Results of Fractures. *Guy's Hosp. Gaz.*, 1917, XXXI, 197.

Regarding the relation of function to the anatomical position after fracture of the long bones, good anatomical results meant good function in 90 per cent of the cases and bad anatomical results resulted in bad function in 53 per cent. In fractures of the long bones treated without open operation, good functional results were obtained in patients under fifteen years in 90 per cent of the cases, and over fifteen years in but 45 per cent, while in cases treated by operation the percentage of good function under fifteen years was 93 per cent and over fifteen years was increased to 66 per cent.

Massage in fractures should be started practically immediately. Voluntary movements, in so far as they are not painful, are not harmful and should be begun fairly early. The patient will not willingly hurt himself. Passive movements, however, generally speaking, should not be applied before the third or fourth week.

The author calls attention to that point in military surgery which cannot be emphasized too often, that in gunshot fractures osteoplastic operations should not be undertaken until many months after all wounds have healed, and he claims it is often unsafe to operate within two years after suppuration has ceased. Another cardinal rule is that in general when performing an operation on war fractures as little as possible should be done; the simplest procedures should almost invariably be those adopted.

R. B. BETTMAN.

SURGERY OF THE BONES, JOINTS, ETC.

Cook, F.: Gunshot Wounds of Joints; Their Pathology and Treatment. *Guy's Hosp. Gaz.*, 1917, XXXI, 346.

Recognizing that in gunshot injuries of joints it is the rule that the infection in the joint is localized for the first twenty-four hours to the track of the missile, and that it is not until after that time that the general synovial fluid and effused blood show the presence of organisms, the earlier the primary or prophylactic form of treatment of the wounded joint, the better. This implies proper facilities for thorough surgery, including a preliminary X-ray examination, a patient in condition for operative treatment, and no urgent need for early transporta-

tion of the patient after operation. Such primary treatment is to include excision of external wounds, arthrotomy with removal of foreign material, blood clot, infected synovial edges, removal of fragments of bone, cleansing of bone cavities in which foreign material has been imbedded and closure of the joint by accurate suture of the synovial membrane with absorbable material, if possible. "A strictly conservative line of treatment is preferable to half-hearted operative measures," and if thorough operative measures cannot be carried out, "immobilization is the most important measure in the early stages," to limit the spread of infected particles throughout the joint until such time as thorough treatment can be done, which should be at the earliest possible opportunity.

Primary resection of the joint as a prophylactic measure to prevent infection has proved to be unnecessarily radical in the majority of cases and should be reserved for such cases as will obviously need such treatment for a functional end-result. Amputation as a primary measure is reserved for such joint cases as are associated with hopelessly extensive wounds or injury to the blood supply of the limb.

H. B. LOMER.

Groves, E. W. H.: An Operation for the Repair of the Crucial Ligaments. *Lancet*, Lond., 1917, CXVIII, 674.

Rupture of the crucial ligaments is much more frequently recognized than formerly, due to routine X-ray examination, which often reveals fracture of the tubercles of the tibial spine, and to the greater frequency of "exploratory" operations upon disabled knees. This injury is an extremely serious one, which produces permanent total disablement for active pursuits and necessitates very prolonged treatment by immobilizing apparatus. It is impossible to regard intra-articular suture of the ligaments, either by soft sutures or wire, as an efficient procedure or as one free from the risk of leaving loose bodies in the joints.

Groves has operated successfully on one patient by the following original technique, forming a new anterior crucial ligament from the iliotibial band and a new posterior ligament from the tendon of the semitendinosus.

A wide horseshoe incision is made across the joint, the lowest point being below the tibial tubercle and the lateral ends running up to the lines of the hamstrings on each side. The tubercle of the tibia is freed by two saw cuts, one behind and parallel to the ligamentum patellæ and the other at right angles to the tibia below the tubercle. The patella is turned upward sufficiently to expose the interior of the joint, without cutting the iliotibial band. The joint is now fully flexed and the condition of the crucial ligaments and of the spine of the tibia is ascertained.

The lower end of the fascia lata is exposed and defined upward above the level of the external condyle and downward for about an inch below the

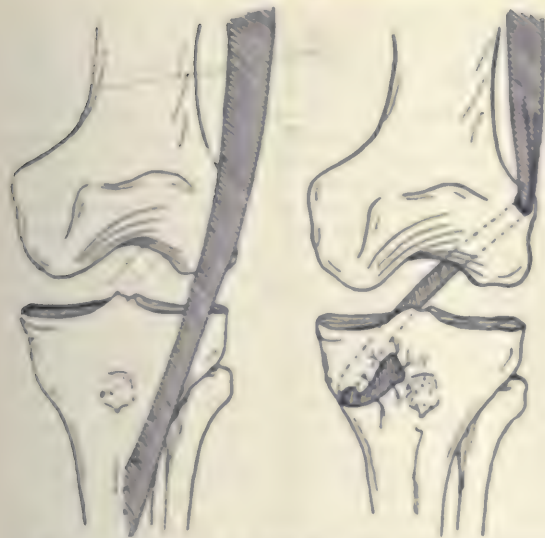


Fig. 1. Formation of a new anterior cruciate ligament from the iliotibial band. (Groves.)

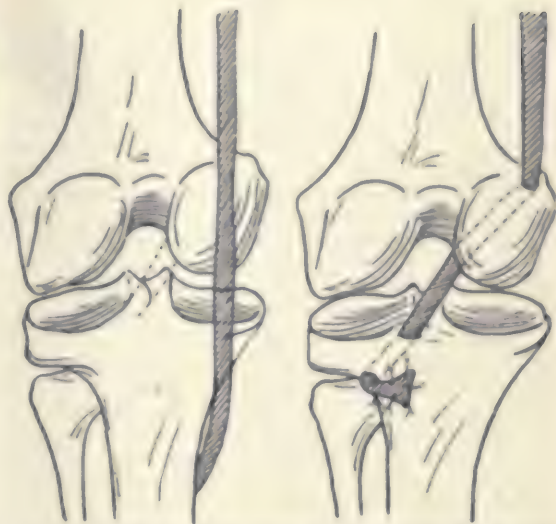


Fig. 2. Formation of a new posterior cruciate ligament from the tendon of the semitendinosus. (Groves.)

tubercle of the tibia. There it is cut across and dissected upward free from the underlying structures. With the knee fully flexed, the two points of attachment of the torn ligament are clearly defined and cleared of soft tissue. With a one-fourth inch twist drill a canal is bored from within the joint upward and outward through the external condyle of the femur and another downward and inward through the internal tuberosity of the tibia, beginning in each case with the point of attachment of the original ligament. The iliotibial band rolled up as a cord is threaded through the femur and the tibia and drawn tight. Where it emerges below the knee the fascial ligament is turned upward and sewn to the deep fascia and periosteum of the tibia.

If both ligaments have to be re-formed, the posterior will naturally be repaired first. The inner limb of the horseshoe incision is prolonged backward and upward until the inner hamstring is exposed and the tendon of the semitendinosus is defined. This is cut from its lower attachment one and one-half inches below the joint. New canals are then formed by drilling from within the joint upward, inward, and backward through the internal condyle of the femur, and then downward and outward through the external tuberosity of the tibia. Through these canals the semitendinosus tendon is threaded and fixed to the periosteum of the tibia.

The tubercle of the tibia is refixed in its original position by an ivory or metal nail and the joint capsule carefully closed by catgut sutures. The knee is kept on a back splint for about a fortnight, and then when the skin incision is soundly healed it is removed daily from the splint for gentle massage and passive movements. After one month the

splint is discarded and the patient allowed up on crutches. Full use of the limb is gradually restored, as this can be done naturally without pain or force.

ALBERT EHRENFRIED.

Quénu, E.: *Wounds of the Foot and Instep by War Projectiles* (Étude sur les plaies du pied et du cou-de-pied par projectiles de guerre). *Rev. de chir.*, Par., 1917, lli, 373.

Quénu concludes his extensive and elaborately illustrated article on war injuries of the foot and summarizes his results.

The main idea governing treatment has been to preserve the largest part possible of the injured foot provided that life was not menaced by so doing. Preservation is for utility, preservation of function and locomotion.

Quénu differs entirely from the view of American orthopedists who are unanimous in the opinion that a leg amputation well executed at the site of choice is superior from the point of view of prosthetics and of functioning to any partial amputation of the foot, that amputation stumps in such cases are not satisfactory, while leg amputations at 4 to 5 cm. above the tibiotarsal joint enable patients when they have a good apparatus to walk as well as with their two legs.

Quénu considers these opinions surgical heresies and believes that his long series of partial amputations of the foot as detailed in these articles, the transmetatarsal amputations of Lisfranc and Chopart, the subastragalar amputations of Pirogoff and Ricard, and the supramalleolar amputations of Syme and Guyon are witnesses against the fallacy of the American view. The case reports now submitted are impartial evidence of the excellence of

these operations. They justify the efforts made for maximum conservation; a leg amputation ought only to be a last resort either primarily or secondarily when life is threatened or when the preserved segment is incompatible with function.

The primary operations which permit a maximum conservation are resections and cleansing operations, these having the same general indications for the foot as in other regions. For a resection it is necessary that the skin and soft parts should not be badly injured; in fact, resection is best suited to those cases when the deeper lesions contrast by their extent and importance with the slight external injuries; moreover, resection is more suitable to those cases where the bone injuries are confined to a segment. Crushing injuries where there is extensive loss of skin and subcutaneous tissue call for an amputation. The choice of the type of amputation depends on the site of the bone lesions, and the amount of healthy skin at disposal.

Metatarsal injuries usually call for cancraneal osteoplastics or a Guyon amputation, but a Lisfranc or Chopart transmetatarsal operation may be possible, depending on the limitation of the bone injuries. Injuries to the posterior part of the foot do not favor conservative operations. Quénu has not had a single case of the Wadimiroff-Mikulicz operation.

Destructive injuries of the instep almost always call for leg amputation. Partially destructive lesions with preservation of the skin give different indications according as they are localized in the astragalus, calcaneum, etc. Resection of the astragalus is the operation of choice in all total fractures of the bone. In ankle-joint lesions, astragalectomy should not be done in all cases; the indications vary according as the osseous destruction is limited to the malleolus and tibial articular surface or extends to all the lower extremity of the leg bone. In simultaneous lesions of the tibia, calcaneum and astragalus, the indications for astragalectomy are strict and it should be completed by a partial resection of the calcaneum.

Quénu gives the indications for secondary and late interventions.

W. A. BRENNAN.

Lord, J. P.: *Conservative Surgery of the Feet; with Report of a Case.* *Surg., Gynec. & Obst.*, 1917, XXV, 422.

Lord protests against the ancient classic tarsal amputations which followed the principle as laid down by Agnew, Mayer and Guerin that the bones of the foot should be considered as a skeletal unity to be treated by the knife and saw at the exact point which will yield the largest and most useful stump to the patient.

He reports the case of a boy of sixteen who received a gunshot injury carrying away the Achilles tendon, the posterior tibial tendons, artery, vein, and nerve, the internal malleolus, the inner half of the astragalus, a portion of the scaphoid, a distal portion of the tibialis anticus tendon, and all of the

skin, fascia, and ligaments in the path of the charge. First aid had been efficient. The case was seen after forty-eight hours. All devitalized tissues were cut away. The patient was removed to the hospital on the fourth day. One month later the remaining half of the astragalus was excised and the cartilaginous surfaces removed from the tibia, fibula, scaphoid and os calcis; the external malleolus was displaced forward one-half inch. The parts were stabilized by a wire nail through the os calcis into the tibia.

One month later, tenoplasty was done on the Achilles, the posterior tibial, and the anterior tibial; neuroplasty was done on the posterior tibial nerve, which was lengthened two and one-half inches and imbedded in fatty tissue. Except for a small area in the skin, there was primary union.

For more than a year the patient has had good use of the foot. The limb is five-eighths of an inch short, a deficiency partly corrected by a felt pad under the heel and two extra lifts on the heel of the shoe. There is a very slight limp, due to the stiff ankle, but no pain. Sensation has returned except in a small area on the heel.

Patel, M.: *The Value of Total Tibiotarsal Resection in Fractures of the Lower Part of the Leg* (De la valeur de la résection tibio-tarsienne totale dans les fractures de la partie inférieure de la jambe). *Bull. et mém. Soc. de chir. de Par.*, 1917, XLII, 1970.

Patel refers to 4 cases of infected fractures of the lower part of the leg in which not only the joint, but the bone itself, was invaded. In one case the tibio-fibular lesion extended 5 cm. above the tibio-astragalar alignment. The bone tissues were principally involved, the soft parts being more or less intact.

Instead of amputating, which procedure seemed indicated, Patel sectioned the tibia and fibula at 5 cm. from the joint, removed the astragalus, approximated the tibial stump to the calcaneum and fixed it in place by a plaster apparatus. The result exceeded his anticipations; two months later there was union which gave marked rigidity of the foot and promised an excellent functional result. This was actually realized 6 months later; the patient could then use his foot perfectly.

Encouraged by the result, the author followed this same procedure in 3 other cases; all resulted excellently. No special technique is followed; any periosteum remaining is carefully preserved and the ligamentous attachments of the malleoli are carefully freed. Radiographs show the resection of the astragalus with the removal of 5 cm. of the tibia and the resulting bony union between the tibia, fibula, and calcaneum.

W. A. BRENNAN.

Soubeyran and Perret: *Reconstitution of the First Phalanx of the Thumb by Means of a Cartilage Graft* (Reconstitution de la première phalange du pouce à l'aide d'une greffe cartilagineuse). *Lyon Méd.*, 1917, CXXXVI, 479.

A soldier was struck by a piece of shell which fractured the metatarsal and the first phalanx of the

right thumb. A fistula and a pseudarthrosis developed. The thumb was useless. Of the first phalanx only two small fragments remained which represented the two articular extremities.

A longitudinal dorsal incision of the thumb was made. The fistulous tract was excised with resection of the lower phalangeal fragment which was attacked by osteitis. The metacarpal fragment was curetted and allowed to remain on account of the muscular insertion. A cartilaginous ring about 4 cm. long was removed from the tenth costal cartilage, buried in the thumb tissues and fixed to the periosteum by catgut cutaneous suture and thumb splint. Primary union followed.

Two months later the thumb was well cicatrized and had assumed its normal shape. The first phalanx offers bony resistance. The thumb articulations are perfect; the man is able to seize objects between the thumb and index finger. Movements of the first phalanx on the second are restricted on account of the tendon losses. W. A. BRENNAN.

Beck, C.: Tendo- and Neuroplasty. *Surg. Clin. Chicago*, 1917, i, 985.

After traumatic section of the ulnar nerve and the tendons on the medial side of the arm just below the wrist, a good result was obtained by two operations. In the first, the nerve was repaired by cutting off a lateral graft from the proximal portion to bridge the defect, and the tendons of the flexor carpi ulnaris and the long flexor muscles approximated and sutured, the latter with some difficulty on account of extension contracture of the fingers. Nerve function returned, but contractures due to the scar resulted in permanent flexion deformity of the second, third, and little fingers.

At a second operation tenotomy of the superficial and deep flexors of these fingers was done at two levels through a palmar incision so that when the fingers were extended the distal end of the superficial was approximated to the proximal end of the deep tendon. Union took place and the result was good flexion of the fingers except for the last joint which was precluded by making the two tendons of each finger into one. W. A. CLARK.

Little, E. M.: Modern Artificial Limbs and Their Influence upon Methods of Amputation. *Brit. M. J.*, 1917, ii, 550.

In amputations of the lower limbs the first consideration must be weight-bearing, while for the arms the co-ordinated movements should be considered. An ideal stump should be as long as possible, covered with movable soft parts; the scar should not be in a position exposed to pressure, or adherent to the bone; and enough active muscle should be left attached to move it with adequate force. Amputation at joints is objectionable because the stump will be bulbous in form, extra large flaps are necessary, and the joint of an artificial limb will not come at the right place. Stumps in the lower third of the thigh are much more sound than those

of the middle and upper thirds. In the arm the upper three or four inches of the humerus are unavailable as an attachment for the artificial member. Every inch here counts, and as much bone as possible should be saved when amputating above the middle of the humerus, even though there may not be enough skin to cover it. For the region of the elbow, amputation above the condyles is to be preferred if the forearm bones for at least an inch and a half below the biceps insertion cannot be saved. The contraction of the biceps tends to push off the bucket of the artificial arm. Therefore the middle third of the forearm offers the best site for amputation. The lower third does not give a good stump on account of cyanosis and poor nourishment.

For the thigh, amputation between the trochanters is better than the upper third, for such a short stump is not a sufficient lever to move the artificial limb. About forty-two per cent of all thigh amputations of the 549 amputations at Roehampton which furnish the basis for this discussion were at the middle third. The eccentric position of the femur should be remembered and as much as possible of the thinner soft parts on the external aspect of the bone should be conserved.

Supracondylar amputation gives the best thigh stump for fitting an artificial leg. Below the knee, the most favorable site is the lower part of the middle third, for in the lower third the bones are too small and the soft parts, being badly nourished, become cold and cyanotic. The Pirogoff amputation of the foot often results in a tilting over of the os calcis, and a Chopart stump is pulled by the calf muscles so that the lower end is turned downward, exposing the scar to pressure. A Syme amputation just above the malleoli is to be preferred to either of these. W. A. CLARK.

ORTHOPEDICS IN GENERAL

Litzenberg, J. C.: Sacro-Iliac Joints in Obstetrics and Gynecology. *J. Am. M. Ass.*, 1917, lxi, 1759.

Litzenberg has reviewed the literature, analyzed his own experience and appended several case reports to prove (1) that the sacro-iliac synchondrosis is a true joint and is, therefore, "subject to the same diseases and ailments as other joints"; and (2) that in the case of many women who for years have been treated for female trouble, an examination of the sacro-iliac joint is finally made and a correct diagnosis given.

Sacro-iliac joint affections may occur in the pregnant or the non-pregnant woman. Trauma and infection are the common causes, trauma being the most common cause.

"Every pregnant woman is a potential sacro-iliac joint patient and should have her pelvis supported and faulty attitude corrected by a properly adjusted maternity corset." Not every sacro-iliac joint during pregnancy presents a pathological condition, but it is certainly more movable and therefore more liable to cause pain.

In the non-pregnant state the sacro-iliac joints are usually fixed, but may, under certain circumstances, become movable and subsequently may become painful. Hence every woman who complains of lumbosacral backache should have the sacro-iliac joint carefully examined to make sure whether a joint condition or an intrapelvic lesion exists.

In any case, treatment cannot be successfully instituted until one has definitely determined the exact condition present. Specially constructed maternity corsets, sacro-iliac belts, adhesive straps and special devices for immobilization of the joints are the devices recommended by the author in the treatment of these joint affections.

H. B. MATTHEWS.

Ozark: *A Study of the Operative Treatment of Osteo-Arthritis of the Hip-Joint.* *Boston M. & S. J.*, 1917, CLXXVII, 979.

This is a report of the operative treatment of 26 cases of osteo-arthritis of the hip-joint, 10 cases of old tuberculosis, 3 cases of old congenital dislocation, and 1 old fracture of the neck. The operations were done at the Massachusetts General Hospital, largely by Brackett.

The article is divided into three parts. The first part contains a short discussion of the etiology, the indications for operation, the types of operation, with a description of the technique in the various procedures, and the after-treatment. The second part reports the end-results in seventeen cases that returned for observation after a certain interval. The third part interprets the end-results.

The following conclusions are drawn:

In monarticular, non-tubercular cases it is always possible to relieve the disability of the leg by an arthrodesis, which can be repeated if necessary.

In polyarticular cases, if both hips are involved, the motion in one of the hips must be restored by some such operation as decapitation of the head of the femur.

In cases of tuberculosis, definite relief cannot be expected to the same degree as in osteo-arthritis, but the operation has produced no bad effect on the general or local condition, and has given marked benefit in the majority of the cases.

Arthrodesis has appeared to be especially beneficial in cases which have arrived at a stage of disability where the patient is demanding a more serviceable leg. The leg will be stronger and less troublesome after the operation, and hence arthrodesis is the operation of choice in cases where only one hip is involved. If an operation is required to restore motion in a joint, careful judgment must be used.

LEOYD BROWN.

Linger, E. A.: *Talipes Equinovarus.* *J. Mich. St. M. Soc.*, 1917, XVI, 464.

The author considers the surgical treatment of talipes equinovarus. To understand the operative treatment one must know the underlying pathology.

Little can be said of etiology, since little is definitely known. The pathology involves both soft parts and bones. The foot is sharply supinated by the shortened tibialis anticus. The anterior part of the foot is sharply adducted by the tibialis posticus. The flexor tendons of the toes are short. The planta fascia, the gastrocnemius and soleus muscles are all shortened.

Corresponding changes are found in the bones. The astragalus is rotated forward upon a transverse horizontal axis. Its neck is elongated. The scaphoid may be turned far inward. The os calcis is smaller than normal and its anterior part is bent downward and inward.

The symptoms, the author states, are diagnostic. The whole scheme of the operative treatment is to forcibly stretch the shortened tendons and fascia. If this does not allow enough correction, the author severs the contracted tendons and fascia and then the foot is brought to a dorsiflexed and everted position. The author states that the tendo achillis should be severed last, since it serves to hold the foot while adduction and varus are being overcome.

Second to the operative treatment, the success of the operation depends upon fixation of the foot in a cast; then the use of a brace, and finally education of the child to use its feet correctly.

JOHN MITCHELL.

Cumberbatch, E. P.: *The Surging Galvanic Current in the Treatment of Paralysis; a Simple Method of Localizing Contraction to Paralyzed Muscles.* *Lancet, Lond.*, 1917, CXXVII, 570.

Paralyzed muscles must not be stretched during electrical treatment. When these muscles show degeneration following nerve injury, the faradic and sinusoidal currents will not cause contraction of the muscles supplied by the injured nerve, but the healthy antagonists will contract and cause passive stretching of the paralyzed ones.

Application of the galvanic current with a gradual rise to maximum and a slow fall to zero, with the current passing in the same direction as muscle fibers causes contraction of the paralyzed muscles only. Immersion in water allows the use of a maximum strength current with a minimum discomfort, and also produces stimulation and increased blood supply to the other tissues, which the author believes is important in this treatment.

The author describes an apparatus for the production of the surging galvanic current.

H. J. VAN DEN BERG.

Ridlon, J.: *Hip Disease.* *Surg. Clin. Chicago*, 1917, I, 935.

The term "hip disease" has remained with tuberculosis of the hip after the various other forms such as osteomyelitis, osteo-arthritis and osteochondritis have been differentiated. Diagnosis is not always easy. Prognosis in any individual case as to duration and ultimate result is impossible. Osteo-arthritis

in children does not always give a stiff hip as is expected in the adult. Differentiation between Perthe's disease and tuberculosis is not always possible.

Fourteen cases are reported and many roentgenograms are shown in this clinical study of the varieties of diseases of the hip-joint. A boy of nine who had walked lame for two months without pain recovered with practically normal motion four months after application of a spica cast for two weeks, although the final roentgenogram showed a serious amount of destruction in the head of the femur. This case

of Perthe's disease is contrasted with a border-line case in which the course was longer and functional recovery not so good, and with another case, frankly tuberculosis, which extended over six years and resulted in destruction of the head and almost complete ankylosis of the joint.

Another case of unusual interest is that of osteoarthritis in a girl of nine in which the roentgenogram confirmed the diagnosis. A man of fifty treated by various surgeons for 35 years for tuberculosis of the hip was finally found to have had a coxa vara.

W. A. CLARK

SURGERY OF THE NERVOUS SYSTEM

Owen, G.: *Gunshot Wounds of the Peripheral Nerves and Their Surgical Treatment. Med. J. Austral.*, 1917, ii, 389.

The author reports 57 cases of nerve injuries due to gunshot wounds. Practically all of these cases were operated upon in base hospitals.

There are three main types of injuries:

1. Complete division of the nerve. The ends become involved in the infection, adhesions are formed, the ends become thickened, and in some instances a portion of the nerve-trunk may be shot away.

2. Incomplete division and bruising of the nerve. Adhesions form, and a portion of the circumference may be replaced by a hard fibrous patch. If there are sensory fibers present, pain is frequently referred to the peripheral distribution due to neuritis.

3. Nerve shock. In this type of injury there is no actual visible wound of the nerve-trunk, but the missile has exerted some influence on the nerve, causing signs similar to those of a complete division. It is important to recognize this form, because of the difference in prognosis and treatment. The axis cylinder probably undergoes some definite shock from the passage of a high velocity missile in its vicinity.

The diagnosis is made as follows: (a) A careful review of the anatomy of the wound is made; (b) the electrical examination of the muscles will not show the complete reaction of degeneration; (c) these cases nearly all show signs of definite improvement within six weeks, if placed under suitable electrical treatment; there is an improvement in the electrical reactions in contrast to a dividing lesion, in which the changes are more marked at the end of six weeks. No time is lost, as the wound is rarely ready for operation before the end of six weeks.

While one awaits the healing of the wound, the nutrition of the paralyzed muscles should be maintained. This is done by massage and electrical treatment. During this period deformities should be corrected and the affected muscles should be prevented from stretching.

In operating, the strictest asepsis is necessary. "Never cut into a war scar" is a good rule to follow. The normal nerve should always be exposed above and below the lesion and then followed out to the ends. Where there is complete division, it is necessary to remove the fibrous ends, and as a result there may be shortening; but this may be overcome by putting the limb temporarily in a position which gives relaxation. The trunks may be split to lengthen them, or it may be necessary to anastomose to a nearby nerve. The union in most cases has been made by passing one fine catgut stitch in a round needle through the nerve trunk and a series of fine catgut sutures through the sheath only. After anastomosis, the site is protected by muscle, adipose tissue, or Cargile membrane.

It has been found that after adhesions have been removed from about a nerve-trunk, the response to electrical stimulation is immediately increased.

The after-treatment is very important. There must be massage, electrical treatment, correction of over-reaching muscles and deformities.

It is difficult to give a definite prognosis under six months. In general, those cases in which there is only a partial division, or adhesions, offer a good prognosis. In complete division the prognosis must be guarded.

C. A. BOWERS.

Pitres and Marchand: *Treatment of Causalgia by Injection of Alcohol into the Nerves* (Injections intra nerveuses d'alcool dans le traitement des causalgies). *Presse méd.*, Par., 1917, p. 505.

The efficacy of injections of alcohol into the nerve-trunks in treatment of pains of causalgia consecutive to war wounds is known. The author gives the details of 3 such cases, from the study of which he draws these conclusions:

1. Supra-lesional injection of alcohol causes a cessation of causalgic pains which the freeing of the nerve did not affect.

2. Injection of alcohol at 60° into a nerve cord interrupts the sensory conductivity. The motor inertia of antalgic nature accompanying the causalgic pains disappears simultaneously with them.

3. Injection of alcohol at 60° does not notably aggravate the motor paralysis pertaining to a traumatism of the nerve, although it provokes a reaction of degeneration in the muscles innervated by the nerves in which the injection has been made.

4. Injections of alcohol into the nerve below the lesion provocative of the causalgia does not, as has been noted by Sicard, cause a cessation of the causalgic pains. The amount of alcohol injected by the author is about 4 ccm. W. A. BRENNAN.

Tavernier: Immediate Suture of Nerves (*La suture immédiate des nerfs*). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1809.

Tavernier favors immediate rather than delayed suture of nerves injured in war. He reports three cases sutured within 24 hours after wounding. One was a total section of the median, the two others subtotal. Functional restoration rapid and remarkable.

Tavernier thinks that the poor results following delayed suture are to be accounted for anatomically and not by any fault of technique. The infected sclerosed tissues on which late interventions are made account for the inferior results.

Tuffier, in discussing the report, agreed and stated that he had always recommended the primary suture of nerves after disinfection of the wound.

W. A. BRENNAN.

Chevrier, L.: Study of the Surgery of the Nerve-Trunks (*Études sur la chirurgie des troncs nerveux*). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1983.

Chevrier reports the results of operations on the external popliteal and sciatic nerve. There were

two cases of liberation, both followed by recovery. Of 6 total sutures, 4 have been followed and re-examined, and have shown complete recovery with total return of motility. The other two have only been followed for four months and give promise of recovery.

The problem of intervention is more difficult in the case of a nerve which has apparently preserved its continuity than in one wholly sectioned. Many nerves which preserve their anatomic continuity are physiologically sectioned, and many failures in nerve surgery are due to the fact that liberation is only done in cases of such physiological section. A thorough electrical exploration of the nerve is a pre-operative necessity.

In making a total suture operation, Chevrier first frees extensively the nerve, a neurolysis which favors re-union after resection. The chief points in making a resection are that it shall be adequate. Experience has taught the author that in the case of old lesions a little more than the indurated nucleus should be resected; and in the case of very recent lesions a little less than the indurated cylinder.

Having tried various modes of section Chevrier prefers a section perpendicular to the nerve axis at both nerve-ends. The circular surface thus obtained is best for obtaining good approximation in suturing and avoids the risk of axial cylinder disarrangement. Suture ought not to be a mere approximation, but an exact circumferential re-union of the nerve-ends. Chevrier places a large number of catgut stitches in the neurilemma and the most superficial parts of the nerves. Details of his technique are given. W. A. BRENNAN.

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESES, ETC.

Kotzareff, A.: Cerebral Metastases Consecutive to a Primary Melanosarcoma of the Left Labium Majorum (*Quelques métastases cérébrales à la suite d'un mélanosarcome primitif de la grande lèvre gauche*). *Ann. de gynéc. et d'obst.*, Par., 1917, lxxii, 641.

The patient in this case was 56 years old. Her case was diagnosed as melanosarcoma of the left labium majorum, spindle-celled, and probably developed from a pigmented nevus. There was also an inguinal tumor. The whole of the labium was excised and the inguinal tumor removed. She developed palsy in the cervical and upper dorsal region, and on palpation a tumor the size of a nut could be made out depending from the spine of the seventh cervical. There developed later a slight paresis of the upper limbs and loss of sensation. The patient left the hospital in this condition. She returned later with the symptoms aggravated; her condition was then diagnosed as total aphasia,

with slight hemiplegia. A few weeks later she died in coma. Autopsy showed metastases in the left hemisphere of the brain.

The author draws the following conclusions from a study of this case:

1. Primary melanosarcoma of the external genital organs is very rare. It is the most malignant kind of neoplasm. It is developed at the expense of richly pigmented skin or a pigmented nevus.

2. Metastases are very numerous, especially in organs of mesodermic origin.

3. The nervous system is rarely involved.

4. Metastases may be colored differently: white, black, or mixed.

5. Diagnosis is easy after biopsy or reaction with the urine.

6. There is no specific treatment. Surgical treatment is ineffective because there is recurrence and metastasis. Radium treatment may give some relief.

7. In this case it can be stated with certainty that the primary tumor of the left labium com-

nenced by a pigmented nevus, because the patient showed many of these on the external genitalia and on the skin of the trunk and face. The tumor developed slowly during the first four months. Toward the fourth month there were metastases to the ganglia. Some time before the patient's death there were metastases in the left lung, in the left hemisphere of the brain and the vertebral column, with hæmorrhagic softening of the inguinal ganglia.

5. These questions remain to be solved: Why were all these metastases to the left? By what route were they formed, (a) in the vertebral column, (b) in the brain? W. A. BRENNAN.

Gray, H. M. W.: *The Use of Liquid Paraffin in the Treatment of War Wounds*. *Brit. M. J.*, 1917, II, 509.

Clinical observations on the effect of liquid paraffin upon wounds in different stages show that:

1. It prevents the development of symptoms of inflammation in the walls of the wound, and redness and swelling of the skin do not develop, or, if present, disappear. Pain is assuaged and performance of function made easier.

2. Liquid paraffin is not antiseptic, but if an antiseptic is dissolved or suspended in the liquid paraffin with which a gauze pack is saturated, the wound becomes or remains sterile. The antiseptics so used have been chiefly flavine, brilliant green, boric acid, and iodoform. It is rather difficult to justify preference for any one of these. As there is possibly a selective action of the particular antiseptic against the particular organism, a combination seems desirable. Non-poisonous antiseptics with more or less prolonged action when in contact with body fluids are likely to be most successful.

In all cases it is essential for success to have a thorough preliminary opening up, mechanical cleansing, and excision of damaged tissue.

C. A. HEDBLÖM.

Roger, H.: *Nervous Shock* (*Le choc nerveux*). *Rev. de méd.*, Par., 1916, xxxv, 422.

The practical conclusion at which Roger arrives after a long experimental study of nervous shock is that since the effect of shock is to diminish the quantity of carbonic anhydride contained in the blood, the patient may be made to inhale a mixture of carbon dioxide and oxygen. Levi has applied this in different morbid conditions and insists on its good results in shock. He employed a mixture containing 15 per cent of carbon dioxide and 85 per cent of oxygen. In the surgical clinics of Florence apparatus containing the gas mixture is provided in the operating rooms and it is administered at the least sign, thus avoiding anæsthetic and shock accidents. By inhaling the mixture after the operation is ended, owing to the exciting action of carbon dioxide, respiration is activated, and the tendency to vomit is avoided. W. A. BRENNAN.

Scott, T. B.: *The Internal Secretions*. *Practitioner*, Lond., 1917, xcix, 474.

In the last two years two gland-extracts have come into notice which were rather on the shelf before, i. e., the parathyroid and the anterior pituitary, or, in its modern name, pitglandin. Thus there exist as the chief therapeutic weapons the thyroid, suprarenal, pituitary, ovary, testis, and parathyroid. Regarding the internal use of the extracts of some of these glands, the author relates his experiences with the hope that they may be suggestive and stimulating to others.

He calls particular attention to the report of a special committee on the ductless glands made to the Italian Society of Medicine, as follows: "The more a man allows the fundamental principles, brought out by the intensive study of functional pathology, to influence his practice, the greater will be his respect for the endocrine glands, and the methods of diagnosis and treatment which increased knowledge of them makes possible."

The author reviews the present knowledge of the effects which follow the removal of the parathyroids and of the anterior part of the pituitary and of the therapeutic effect of these glands administered for various conditions.

He expresses his opinion that pitglandin or tethelin is a valuable and safe restorer of power in the feebleness of old age. "From its intimate connection in early life with the process of growth and, especially, perhaps, with the development of the gonads, one would expect to find some stimulating effect on the nervous system all through life, and apparently we do so." GEORGE E. BEILBY.

Lane, J. W.: *The Pilonidal Sinus*. *Interst. M. J.*, 1917, xxiv, 956.

The pilonidal sinus is located over the sacrum about the midline of the back, discharging intermittently a thin purulent liquid. It develops from failure of the lower end of the medullary canal to completely close in the foetus, resulting in an invagination of cells of ectoderm which differentiate and produce the more highly organized hair follicle, with growth of hair at puberty.

Examination of the sacral regions of 85 children between the ages of six months and four years showed 4 sinuses and 29 sacral dimples. Sacral dimples or depressions at the lower end of the sacrum correspond to the end of the medullary canal in the foetus and are regarded as potential sinuses depending on trauma or infection to start the inflammatory reaction, with the above sequela.

Sinuses usually develop in early adolescence following the history of a fall upon or a contusion to the sacral region, with the subsequent development of a sore over that region, and later a bloody or purulent discharge causing no particular pain but running a chronic course until the patient seeks relief in operation.

Technique consists in excision *en bloc* of the sinus under local anæsthesia, including all ramifications,

which are discovered by means of a probe. Exact locations should be mapped before beginning the excision.

As to pathology, hair is found in most cases. In long neglected cases the sinus has been reported to have entered the pelvis through the sacrosciatic notch, appearing on the body surface beside the anus.

H. J. VAN DEN BERG.

Stewart, G. N., and Rogoff, J. M.: Effect of Stimulation of Sensory Nerves upon the Rate of Liberation of Epinephrin from the Adrenals.
J. Exp. Med., 1917, xxvi, 637.

The fact that the spontaneous liberation of epinephrin is dependent upon the integrity of certain efferent nerves running in the sympathetic system has led to attempts to influence the rate of liberation reflexly. The authors have previously published experiments in the cat in which the rates of liberation of epinephrin during and without stimulation of brachial nerves were compared by means of the denervated eye reactions of Meltzer and by the rise of blood-pressure produced when adrenal blood collected for a known time in a cava pocket was released, and the results were negative.

They have since repeated the experiments on cats and dogs, drawing off blood from the cava pocket and testing it on rabbit intestine and uterus segments. In this way the adrenal blood was applied to the test-objects without dilution, whereas with the eye and blood-pressure reactions, it was necessarily much diluted. On the other hand, the use of the latter reactions has some great advantages. The blood is not withdrawn from the vessels, and accordingly there is no danger of loss of a part of the epinephrin in the necessary manipulations before the blood is applied to the segments. The development of the pressor property of clotted blood, a serious complication for some of the methods of testing extravascular blood, is avoided, and possible effects upon the rate of liberation of the loss of blood, or even of the loss of the epinephrin in it when withdrawn from the body, are also excluded. Most important of all, the rise of blood-pressure, especially if interpreted by the aid of the eye reactions, affords a direct quantitative comparison of the amount of epinephrin liberated in successive observations.

The authors carried out a series of 9 experiments on dogs. The adrenal blood was collected through a boiled and oiled cannula in the inferior cava. The cava pocket was usually much shorter than that employed for the eye and blood-pressure reactions, where it was essential to have as roomy a pocket as possible. With the short pocket only a small dead space was left filled with blood which had passed through the adrenals during one set of experimental conditions at the moment when the experimental conditions had been changed. To reduce still further any overlapping of the blood samples successively collected with and without stimulation, excitation of the sensory nerve was

started slightly before completion of the collection of the preceding "no stimulation" sample, and vice versa. Once begun, the flow of blood from the cannula was interrupted, sample after sample being collected. The time of collection and the weight or volume of blood being accurately measured, the rate of blood flow during the collection of each sample was known.

To summarize, an attempt was made by the authors to determine whether stimulation of afferent nerves, sciatic and brachial, produced a detectable increase in the rate of liberation of epinephrin from the adrenals, as determined by testing adrenal vein blood on rabbit intestine and uterus segments. The result, they state, was negative.

GEORGE E. BRIDGES.

Addison, W. H. F.: The Cell Changes in the Hypophysis of the Albino Rat After Castration.
J. Comp. Neurol., 1917, xxviii, 441.

The operation of castration of the albino rat is followed by definite progressive alterations in the structure of the ventral glandular portion of the hypophysis.

Both immature and adult animals were used. The hypophysis material from the experimented animals was taken at varying periods after operation, the longest period being nine months. Always the hypophysis from a control animal of the same litter was taken as a control.

The author's summary is as follows:

1. Castration in the male albino rat produces definite histological changes in the structure of the ventral glandular portion of the hypophysis. These include changes in the glandular cells, increase in the size of the blood channels, and marked production of colloid.

2. The cells of this portion of the hypophysis are, in the classification here used, acidophiles, basophiles, and reserve cells. After castration the basophiles increase in size and number. The larger ones begin to become vacuolated at two months after operation. During succeeding months the number of vacuolated cells increases, the larger ones becoming ring-shaped with cytoplasm and nucleus at the periphery, and the central part made up of the colloid-containing vacuole. The acidophiles are not much affected at first, except for a slight diminution in average diameter. Gradually some of them show a diminished number of granules and lessened stainability. At seven months after castration the number of distinctively stained acidophiles is decidedly reduced. Some of the reserve cells in the first months after castration appear to become basophile cells. In the latter months some of the acidophiles appear to gradually differentiate into reserve cells.

3. The basophiles, after certain fixations, show a large cytoplasmic body which may be the reticular apparatus of Golgi, or a centrosphere, or both combined. The acidophiles show a similar structure, much smaller in size.

4. The experiments afford strong evidence for the view that there are at least two actively functioning types of cells in this part of the hypophysis and that both of these are derived in histogenesis from a less differentiated type, i.e., reserve cells. Some of the latter persist during mature life and serve as the source of supply for the other two types.

M. M. MILLER.

Folin, O.: Recent Biochemical Investigations on Blood and Urine; Their Bearing on Experimental and Clinical Medicine. *J. Am. M. Ass.*, 1913, LXX, 1209.

The author discusses this question with reference to its bearing upon clinical and experimental medicine and expresses his conviction that both the biochemist and the clinician must pay more and more attention to this important aspect of medical research. Scientists of earlier generations made many discoveries in the realm of metabolism and medicine; but the pioneer stage is over, and the surface problems have been largely solved.

It is only by means of finer and ever finer technique that progress can be made toward the solution of the many metabolism problems which must be solved by the present generation and those who follow in order to secure an increasingly better basis for clinical, experimental, and preventive medicine.

GEORGE E. BEILBY.

Stewart, G. N., and Rogoff, J. M.: The Relation of the Spinal Cord to the Spontaneous Liberation of Epinephrin from the Adrenals. *J. Exp. Med.*, 1917, XXVI, 613.

The authors were not aware of any evidence upon the question as to where the central mechanism which sustains this secretion is situated and they therefore undertook this study. Elliott's statement that exhaustion of the store of epinephrin in the adrenals by electrical excitation of afferent nerves does not occur if the cord is transected anywhere below the level of the vasomotor center in the medulla oblongata, but does occur when transection of the brain-stem is made just above the anterior corpora quadrigemina, has, the authors believe, no direct bearing on the question, for it has not been proved that the exhaustion of the store is due entirely or mainly to increase in the rate of liberation of epinephrin, on which Elliott made no observations. A change in the amount of the store of epinephrin would merely show that some alteration had occurred in the relation between the rate of formation and the rate of discharge of the epinephrin. Nor do they believe that such observations would, even if accepted as proving an increase in the liberation brought about reflexly through a center in the bulb or higher up, give any indication whether the steady spontaneous liberation of epinephrin is sustained from a center at this level.

Absence of effect of afferent stimulation upon the epinephrin store after section of the cord just below the bulb likewise affords no indication whatever that

the rate of spontaneous liberation of epinephrin has been interfered with. As a matter of fact, they found in cats that after transection of the cord at various levels in the cervical region, the secretion of epinephrin into the blood, far from being abolished, proceeds without interruption. The rate of liberation may even remain sensibly the same, within the limits of error in the methods used for estimating it, as before the section. This was illustrated in one of their experiments in which adrenal blood was obtained from a cava pocket before and after section of the cord opposite the body of the fourth cervical vertebra, between the fourth and fifth cervical segments.

They record a series of experiments upon cats in which the cord was transected at various levels in the cervical region. In all, eight experiments were made, the results of which the authors consider singularly consistent, particularly in view of the fact that there was no selection of experiments. The eight experiments comprise all those performed, except one which was not reported because the animal died before it was satisfactorily completed. The results indicated clearly that there existed in the cord between the last cervical segment and the fourth thoracic segment a mechanism which sustained the output of epinephrin from the adrenal glands after the cord was severed from the higher parts of the central nervous system. The experiments proved definitely that the center did not extend lower than the thoracic segment mentioned, and that at least an important part of it lay below the level of the last cervical segment. The possibility, however, was not excluded that the center might extend for some distance above the last cervical segment.

It is of interest in connection with the currently accepted view of the development of the adrenal medulla that the portion of the cord at which the sympathetic outflow begins should be identified as a center controlling the liberation of the only constituent of its secretion hitherto definitely recognized. If epinephrin in the quantities and concentrations in which it appears in the adrenal blood could be shown to fulfill an important office in maintaining the function of the sympathetic by activating certain of its elements, or by heightening or prolonging the effects resulting from its excitation, the location of an epinephrin center in the sympathetic region of the cord might acquire a new significance, and it might then be permissible to speculate upon the possibility that the relative constancy of the epinephrin discharge, so puzzling on the hypothesis that it directly influences physiological events by virtue of the gross changes necessary to produce a detectable hyper- or hypo-adrenalinaemia, is associated with a more general and permanent action upon the sympathetic mechanisms, which does not entail the necessity of abrupt outbursts and remissions in the rate of liberation. To employ the authors' simile, if epinephrin is not the horse in the sympathetic machine

which must go now faster, now slower, nor even the whip which must sometimes be wielded vigorously and then be laid aside, it is perhaps the lubricant which, whether the axle turns fast or slow, need not vary much in amount.

The possibility must not be lost sight of, however, that epinephrin, although the first definite constituent of the adrenal secretion to be discovered, is not the only, nor the most important, one which exists. It is difficult to conceive of a nervous control so complete as that which governs the output of epinephrin being developed in the case of a substance functionally unimportant. Yet, as the authors have shown, the output of epinephrin from the adrenals in cats is greatly and permanently reduced or abolished by section of the adrenal nerves without apparently interfering with the life or health of the animal. Section of the dorsal cord has also been shown to produce a similar effect upon the output of epinephrin and is well known to be compatible with good health and long survival. The authors conjecture as to the possible existence of some as yet unknown substance of more importance than epinephrin which is normally given off from the adrenals under the influence of nerves, the secretion of which is eventually resumed after the nerves have been severed.

From their experiments the authors draw the following summary:

After section of the spinal cord in cats in the cervical region, as low as the last cervical segment, epinephrin continued to be liberated from the adrenal glands. This liberation had all the characteristics of the normal secretion with intact central nervous system. It was sustained through the same nerve paths connecting the cord with the adrenals.

After section of the cord in the middorsal region the spontaneous liberation of epinephrin from the adrenals was abolished within the limits of detectability by the methods employed, the denervated eye reactions of Meltzer, and rabbit intestine and uterus segments.

The portion of the cord concerned in the liberation of epinephrin did not appear to extend much below the third thoracic segment.

In acute experiments on cats under urethane anaesthesia no change in the rate of liberation of epinephrin, which could be detected by the tests employed, was observed when the cord was severed in the cervical region. GEORGE E. BRIDAY.

BLOOD

Perrenot, F.: Dry Wounds of the Large Vessels (*Les plaies sèches des gros vaisseaux*). *Rev. de chir.*, Par., 1917, 66, 244.

Perrenot quotes four cases of the so-called "dry" vascular wounds.

The four wounds found at operation were: (1) wounds of the two humeral veins with contusion

of the artery, (2) an arteriovenous fistula of the femoral vessels in Scarpa's triangle, (3) a lateral wound of the humeral artery, (4) complete rupture of the humeral artery. In all these cases hæmorrhage from the injured vessels was prevented by clot formation which was sufficiently strong to prevent the flow.

In seeking the cause of this phenomenon of "dry" vascular wounds, the author finds that they occur when the agent is a piece of shell and not a bullet. A bullet makes a clean section in the vessel, with considerable hæmorrhage and the rapid development of a hæmatoma. But shell injuries are contused and lacerated wounds. The projectile is usually found in an "attrition chamber" of lacerated tissue which forms its walls; and when the projectile is large, these walls may be several millimeters thick. An important vessel may become incorporated in such a chamber. Even if completely sectioned, its walls may be pressed against each other by one of the projectile surfaces. The area all around is contused and every condition for the formation of a clot is present.

The signs of diagnosis must be sought principally in the projectile tract. This may cross the path of an important vessel. But surgical intervention alone will usually establish the diagnosis.

In treatment, the wound orifice should be ignored and a classic incision made to discover the vessels involved. The incision should be large enough to permit thorough examination. When lesions are found, treatment is the same as in other wounds of the vessels. Ligatures should be used rather than sutures, owing to the contused edges and the necrotic portions of vessels excised. W. A. BRENNAN.

Leriche, R.: Peri-Arterial Sympathectomy and Its Results (*De la sympathectomie péri-artérielle et de ses résultats*). *Presse méd.*, Par., 1917, p. 513.

Leriche has already published his first results from denudation and excision of the sympathetic peri-arterial plexus in neuralgia and other trophic disturbances. Since then others have tried the operation. He now reports 37 cases upon which he has personally operated.

The operation should be more precisely termed a peripheric sympathectomy, and according to the situation should be designated as axillary, humeral, femoral, etc.

When the artery is laid bare the cellular sheath is opened by the bistoury, the artery is isolated for 8 or 10 cm., and as far as possible is denuded of all adhering tissues, either with the bistoury or a cannulated sound. By careful manipulation the arterial wall is not menaced while the cellular decortication is being done. The wound is then closed by layers.

Arterial sympathectomy is followed by a characteristic physiologic reaction. From the very first intervention on the sympathetic sheath there is contraction of the artery. The caliber is reduced to one-third or one-fourth the normal size over the

whole denuded segment. The segments immediately above and below keep their normal volume. The rapidity with which this occurs varies in different patients, and the contraction is more marked in arteries of medium caliber than in the larger trunk vessels.

The secondary signs are a weakening or imperceptibility of the pulse and numbness in the limb, observed in the first hours after operation; but in from three to fifteen hours the characteristic reaction occurs. It is marked by a local increase in temperature of from 2° to 4° and by elevation of arterial pressure. The reactions are temporary and last for about fifteen days.

A study of the first operative results shows:

1. That voluntary muscular contraction apparently depends on the sympathetic.

2. The method of production of "dry" arterial wounds, which are at least facilitated by the arterial contraction occurring after destruction of the sympathetic, is explainable.

3. The true nature of certain neuralgias, if not of all, as such are cured by excision of the periarterial sympathetic nerves.

4. The sympathetic nerves play an important part in the production of Babinski-Froment reflexes, and also of the motor paralyses which follow certain arterial lesions.

The author has performed sympathectomy in different types of cases: in those in which the chief element was pain, in those with contracture, or with vasomotor or trophic disturbances. In 11 cases the operation was done for pain; some patients were entirely cured, but it does not give an absolute result although often favorable. Five cases were operated upon for trophic ulcerations and all were successful. Three cases were for large oedemata; 1 resulted successfully, 1 relieved the symptoms, and 1 gave an incomplete result. In 18 cases operated upon for reflex disturbances there were 3 practically complete recoveries, 10 showing more or less improvement, 2 showing improvement followed by recurrence, 1 in which after a check voluntary movements were resumed, and 2 complete failures.

In the severe forms of the Babinski-Froment syndrome, hot paraffin baths, with massage and re-education, were found necessary to supplement the operation in order to obtain the best results.

W. A. BRENNAN.

Mocquot, P., and Fey, B.: *The Gravity of Arterial Lesions of the Lower Limb in War Wounds.*

(Gravité des lésions artérielles du membre inférieur dans les plaies de guerre). *Rev. de chir.*, Par., 1917, lii, 241.

In their surgical ambulance during four months the authors have observed 61 cases of wounds of the large vessels of the lower limb. Among these there were 27 amputations, representing 44 per cent, and 24 deaths, 23 per cent. If those cases be deducted where death resulted rapidly from shock, etc., there remain 54 cases with 25 amputations and 7 deaths.

Of the 27 amputations, 10 were necessitated by gangrene; it is especially this complication which lends particular gravity to arterial lesions of the lower limb. Sometimes the gangrene is purely ischemic, sometimes it is moist gangrene, but most often ischemic gangrene and gaseous infection develop together in forms more or less extensive and rapid.

The gravity of arterial lesions is still more striking when compared with other limb wounds. In 308 extensive wounds of the leg or thigh, 124 of which were fractures, there were only 27 developments of gaseous infection, of which 8 cases required amputation. Altogether in these cases, only 17 amputations were necessary, or 5.5 per cent, and the total mortality was 35, or 11.3 per cent.

The arterial lesions most frequently observed in the lower limb are lateral wounds or complete sections. There were 6 cases of thrombosis by contusion.

Ischemia is the primary factor. It is much more frequent than in civil practice, and the difference is no doubt due to lesions of the neighboring tissues. The blood supply is not alone interrupted in a principal vessel sectioned or thrombosed, but also the neighboring collaterals are sectioned or thrombosed and cannot aid in re-establishing the circulation.

The second factor of gravity is infections; and there are also minor causes such as bone, venous, and nerve lesions which aggravate the prognosis.

When an arterial lesion is proved or suspected, it is necessary to operate at once, find the vessel, examine the lesion and affect hæmostasis. The best route of approach will usually be the path of the projectile, which should be opened up till the lesion is reached. However, in many cases this is not the method of attack, and the author details such conditions.

For the treatment of infection the authors state that trials of the Dakin fluid according to the Carrel technique do not appear to have given better results than dry aseptic dressings or the use of magnesium chloride.

W. A. BRENNAN.

Utley, F. B.: *An Analysis of 998 Consecutive Complete Blood Counts.* *Penn. M. J.*, 1917, xxi, 100.

Nine hundred and ninety-eight consecutive complete blood counts made with the same instruments throughout and by the same man and with the same relation to meals, exercise, and cold are studied. The hæmoglobin estimation, the number of red cells per cubic millimeter, the color index and the morphology of the red blood-cells were of value only in indicating the presence or absence of an anemia. The enumeration of the white blood-cells was helpful to confirm or point the way to a diagnosis of an existing condition or to suggest its absence in suspected cases. Far more was learned from a study of the various kinds of white blood-cells.

Of the 998 differentials made, a survey shows that

the polymorphonuclear neutrophils, the basophiles, the myelocytes, and lymphocytes practically all fall within the prescribed list stated by the various authorities. There were eighty-eight smears which showed an absolute eosinophilia, of which thirty-seven fall within the list of possible associated conditions found in the literature. In fifty-one, or in 57.9 per cent of the cases, the eosinophilia did not assist in the diagnosis; these included twelve cases of intestinal putrefaction, two cases of morphinism, and nine cases of hyperthyroidism. A survey of this series shows that these patients were suffering from poisons either exogenous or endogenous, and that these poisons are correlated so far as a chemotactic action for the eosinophile is concerned.

There were 166 smears in which the large mononuclears were 5 per cent or over. In this series in 86.2 per cent of the cases, the presence of large mononuclears in excess of normal cannot be explained in the light of our present knowledge. It seems, however, salient that they should be increased in neurasthenia, pulmonary tuberculosis, intestinal putrefaction, and hyperthyroidism, which classed together may be regarded as an asthenic group and total 38.5 per cent in this series. Accepting the chemotactic theory, the whole group of asthenic cases, neurasthenia in particular, may be suffering from an unknown poison responsible for their condition, which has called forth the large mononuclear. There were 20 smears which showed transitionals in excess of 1 per cent. Relative to the claim made by some that the transitional is an old large mononuclear, it is noted that in the present series of 166 cases where the mononuclears were in excess of normal, there were only 13 cases where the transitionals were in excess of normal. This is evidence of the independence of these two cells.

Of the entire series, 586 counts offered no direct assistance in the diagnosis, prognosis and treatment of patients. Of the remaining 412 counts, the way to a diagnosis was pointed out in 23 cases. In the remaining 150 cases the blood count was helpful in diagnosis. A plea is made for uniform classification of blood-cells, for direct haemoglobin readings in grams rather than on the present variable percentage basis, and for the use of certified standardized instruments.

E. B. FREILICH.

Sanford, A. H.: Selection of the Donor for Transfusion. *J. Lancet*, 1917, xxxvii, 698.

The author has used the methods of Brem and Moss in determining the choice of the donor in blood transfusions, and has found the Brem method to be superior, being exceedingly simple, time-saving and accurate in the selection of donors. In addition, the principles of the test can be applied by any one testing the recipient's blood directly with that of the prospective donor.

It should always be remembered that the essential thing in the selection of a donor is certainty that the patient's serum will not agglutinate the donor's corpuscles.

H. H. FREILICH.

Meleney, H. E., Stearns, W. W., Fortuine, S. T., and Ferry, R. M.: Post-Transfusion Reactions; a Review of 280 Transfusions Performed in the Wards of the Presbyterian Hospital, New York City. *Am. J. M. Sc.*, 1917, cliv, 733.

The authors have reviewed 280 transfusions performed on 99 patients with the purpose of discovering under what conditions transfusion is a proper therapeutic measure, what the real cause of the post-transfusion reaction is, and what factors in its production can be eliminated.

Their conclusions are as follows:

1. Transfusion is of real value in cases of hæmorrhage, in clean operative cases before, during, or after operation, in pernicious anæmia, and in some secondary anæmias. It is of little or no value in septic operative cases, cases of bacteræmia, or cases of acute leukæmia.

2. The sodium citrate method of Lewisohn is simple and satisfactory. The blood is taken through a large needle from a vein at the donor's elbow into a flask containing sodium citrate solution. A solution of 5, 8 or 10 per cent is used, made up from chemically pure sodium citrate crystals dissolved in freshly distilled water and sterilized in an autoclave. The final dilution of sodium citrate should be 0.5 per cent, which prevents clotting better than a 0.2 per cent solution. No toxic symptoms were observed from as much as 5 gms., which is equivalent to 0.5 per cent in 1,000 ccm. of blood. After the blood is collected, it is strained through sterile gauze into a second flask to remove any small clots, and is administered by drawing it through glass tubing jointed with short rubber tubes, through a 3-way stop-cock into a glass syringe, and is thence injected through the stop-cock and a medium-sized needle into the recipient's vein. This syringe method of administration is used because it is frequently difficult to enter and stay in the recipient's vein with a needle large enough to let the blood flow by gravity, and it is quicker and easier. All the apparatus is sterilized in water distilled the day it is used, except the flasks and needles, which are dry sterilized. The apparatus is flushed out with citrate solution before the blood enters it, in order to prevent slight hæmolysis from the water in the tubing. By this method a complete transfusion of 500 ccm. of blood can be performed by one person in about thirty minutes.

3. Blood grouping should always be carried out before a transfusion. Where a reliable laboratory is at hand the direct grouping of donor and recipient is not necessary, but otherwise should always be performed. Failure to determine the compatibility of the bloods may result in the patient's death.

4. Post-transfusion reactions occurred in 6.16 per cent of the cases in the series, the reactions varying greatly in degree, but all being evidenced by a rise of temperature to 102° or more.

5. The recipient in good general condition is much more likely to have a reaction than the one in poor condition.

6. The method of transfusion, the blood relationship of donor and recipient, and the blood grouping of the recipient seem to have nothing to do with the occurrence of the reaction.

7. Transfusions of small amounts of blood, i.e., less than 200 ccm., are less likely to be followed by reactions than are transfusions of larger amounts.

8. The more transfusions a patient is given, the more likely he is to have a reaction, especially if the same donor is used a large number of times. The blood of some donors is more likely to cause reactions than the blood of others.

9. In some cases the post-transfusion reaction is accompanied by a marked polymorphonuclear leucocytosis. Whether this is due to intravascular hemolysis or to the formation of a toxic product from the partial splitting of a foreign protein cannot at present be stated. It seems most likely, however, that one of these phenomena is probably responsible for most post-transfusion reactions.

ALBERT EHRENFRIED.

Perry, R. H.: Transfusion and Injection of Blood in Various Diseases of Infancy and Childhood.
South. Pract., 1917, XXXIX, 421.

Perry believes that blood therapy may be curative or beneficial in many diseases of infancy or childhood.

In hæmorrhagica neonatorum he has used the method of Schloss and Commisky. Five to twenty ccm. of blood from one of the parents is injected immediately into the infant's back, two or three injections at intervals of several hours usually sufficing for a cure.

Transfusion offers the best results in hæmophilia, purpura hæmorrhagica, anæmia following traumatic hæmorrhages, and the hæmorrhages of typhoid and diphtheria. The Lindeman technique is the method of choice. Where transfusion cannot be done, the next best thing is injection of whole human blood or blood serum.

Transfusions are indicated but usually have only temporary effect in the primary anæmias. They are contra-indicated in acidosis. Blood therapy should be given a thorough trial in marasmus. The serum treatment of chorea, scarlet fever, poliomyelitis, and erysipelas is still in the experimental stage.

ALBERT EHRENFRIED.

Jeanbrau, E.: Forty-Three New Cases of Transfusion of Citrated Blood (Quarante trois observations nouvelles de transfusion de sang citraté).
Bull. et mèm. Soc. de chir. de Par., 1917, XLII, 1921.

Jeanbrau has already reported 11 cases of transfusion of citrated blood and now reports on 43 additional cases in desperately wounded men. At first he confined himself to extraction of one-half a liter of blood from the donor, but he has extended this even to 750 ccm. He has also changed the proportion of citrate of soda, raising it from 0.4 to 1 per cent. He uses a new ampulla capable of holding 500 ccm.

Neither hæmophilia nor delayed coagulation was observed in any of his cases; however, it is well to administer 2 gr. of calcium chloride per day for two days.

In 40 moribund patients 43 transfusions were made. Counting those surviving more than twenty-four hours and those making a definite recovery, transfusion has given 67 per cent of successful cases. Many were nearly exsanguinated and severely shocked cases.

Jeanbrau draws from the basilic vein of the donor. He thinks that transfusion of venous citrated blood has the advantage that it can be made at the patient's bed. The operation is easy and rapid and can be done in twenty minutes. W. A. BRENNAN.

Hooker, R. S.: The Treatment of Staphylococcus Septicæmia by Transfusion of Immune Blood.
Ann. Surg., Phila., 1917, LXVI, 513.

Hooker discusses the treatment of staphylococcus septicæmia by transfusion of immune blood. His first opportunity to test the practical application of this idea was in April, 1913. Since that time he has had four other cases. The five cases included: (a) two hospital cases, both chronic staphylococcus infections accompanying a long-standing condition of multiple suppurative osteomyelitis and resulting in general sepsis, progressive anæmia and failing resistance; (b) three cases seen in private practice, which were general bacteræmias developing rapidly from localized acute suppurative processes.

In all five cases the patients were so ill at the time transfusion was proposed that the outlook was considered almost hopeless. The two chronic cases made a complete recovery. One of the acute cases, an osteomyelitis of the tibia and radius, made an immediate and uneventful recovery; the other two acute cases, both affections of the face with bony involvement, improved in a most striking manner, but died suddenly, while seemingly convalescent, from cerebral embolism on the eighth and eighteenth days, respectively, following their last transfusion. Four cases were transfused with blood from donors who had been subjected to varying degrees of immunization with vaccines derived from the patient's infecting organism. One case was transfused from a non-immunized donor.

The author summarizes his results as follows:

The general conclusion to be drawn from a study of these cases is decidedly indicative of the efficacy of immunized blood transfusion in chronic staphylococcus septicæmias, and especially in those which complicate bone conditions. This conclusion would seem applicable to any delayed recovery from severe staphylococcal infection where the resistance is lessening and is likely to be non-responsive to active immunization by vaccines.

In acute infections early blood cultures and immediate immunization of a donor are of the utmost importance. If urgent, it is best not to wait for full immunization but to give the first transfusion even after one dose of vaccine. The effects of the

transfusion by study of blood counts, blood cultures and general symptoms should be observed, and the operation repeated as indications arise, being guided mainly by the bacteremia. If the patient has a fairly good blood volume with a high bacterial blood content, there should be no hesitation in removing a considerable amount of blood by venesection just before transfusion.

Hooker states that it would be a great advantage if there were some practical way in which the patient's blood might be tested for its inhibiting action on the growth of the infecting organism and for its opsonic power, and that the blood of various donors might also be so tested and compared advantageously, especially when there is little time for immunization of the donors by vaccines. A careful opsonic determination of the patient's blood and of that of different donors by the method of Newfeld or the employment of a complement-fixation method to determine antibodies might accomplish such a purpose. But neither of these alternatives is easily applicable and both are slow to satisfy the urgent need of quick findings.

G. W. ROCHSIS.

BLOOD AND LYMPH VESSELS

Morf, P. F.: Ligature of the Innominate Artery for Cure of Subclavian Aneurism. *Surg., Gynec. & Obst.*, 1917, XXV, 526.

The author reports the case of a man, 55 years old, who entered the Chicago Polyclinic Hospital suffering from subclavian aneurism. After the usual preparation, he was placed under ether anaesthesia. One incision was made, 13 cm. long, beginning 6 cm. above the clavicle. After dividing the sternal and clavicular attachments of the sternomastoid muscle, the inner third of the clavicle was resected subperiosteally, and disarticulated from the manubrium. This procedure gave free access to the lower portion of the right common carotid, which was followed down to the innominate. The right subclavian artery was traced outward to the inner border of the scaleni. The aneurism was then seen to involve the second part of the subclavian.

In view of the fact that the arteries of the patient showed at least a moderate degree of sclerosis, it did not seem desirable to place the ligature on the first part of the subclavian, in close proximity to the aneurism. It was, therefore, decided that the ligation of the innominate was necessary. The vessel was isolated by blunt dissection and two heavy kangaroo tendon ligatures placed and tied. A third ligature was tied about the common carotid near its origin. Pulsation ceased at once in the aneurism and also in the right radial artery. Closure of the deep parts with catgut and the skin wound with silk-worm-gut followed.

The patient was in good condition at the end of the operation, which took an hour. The right arm was packed in absorbent cotton and placed in a slightly elevated position. There were no symptoms

of cerebral disturbance. During the next few days there was considerable pain in the right arm, which necessitated a few hypodermics of morphine. The aneurism became hard and firm to the touch. At the end of two and one-half weeks, pulsation in the right radial was quite distinct, and at the expiration of three and one-half weeks pulsation began to reappear in the aneurism. The patient left the hospital feeling well, the neuralgic pain having almost entirely disappeared. The hand and arm remained somewhat atrophic and stiff for three months, but persistent massage and passive motion eventually caused these to disappear entirely.

The patient now has occasional attacks of pain in the right arm, which are sometimes brought on by working. The aneurism measures 6 by 3 by 4 cm. The wall is firm and strong except for a small area about 2 cm. in diameter. It has increased only slightly in size. The patient refuses a further operation for excision of the sac.

EDWARD L. CORNELL.

Desplats, R., and Buquet, A.: Traumatic Obliteration of Limb Arteries: Nervous Ischemia in the Wounded (De l'oblitération traumatique des artères des membres, l'ischémie nerveuse des blessés de guerre). *Bull. et mèm. Soc. de chir. de Par.*, 1917, XLIII, 1959.

From certain cases reported, the authors conclude that when the lumen of the principal artery of a limb is destroyed, two alternatives are presented: either collateral circulation fails, in which case gangrene results; or such circulation is efficiently established. Their observations, however, suggest a third possibility, i.e., the possible appearance in the ischemic region of functional nerve disturbances appearing shortly after the vascular obstruction.

Experimental ligation of the axillary artery creates a condition favorable to provoke such nerve disturbance.

Recent works have appeared on the possible influence of the sympathetic in the mechanism of ischemic paralysis, and it is a question whether in arterial wounds the lesion of the arterial wall does not play a part as important as the stoppage of the blood current. Nevertheless, it must be noted that acute or chronic obstruction of the large vessels as in thrombosis is followed by paralysis and anesthesia analogous to the phenomena described by the authors. Ischemia in nerve pathology plays a part similar to that accorded to it in cerebral pathology.

W. A. BRENNAN.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Winternitz, M. G., and Quinby, W. C.: Experimental Nephropathy in the Dog: Lesions Produced by Injection of the Bacillus Bronchisepticus into the Renal Artery. *J. Urol.*, 1917, I, 139.

By injecting pure cultures of the bacillus bronchisepticus directly into the renal artery, progressive

nephropathy similar to spontaneous renal lesions has been produced in a series of experiments on dogs. These experiments have been in accord with the growing impression that micro-organisms are etiologically associated with progressive lesions of the kidney in man. The bacillus bronchisepticus produces spontaneous disease in the dog, and the authors include a report of such a case with autopsy findings. Five ccm. of a thirty-six to forty-eight-hour growth were injected hypodermically, directly into the renal artery, after reaching the kidney through a longitudinal abdominal incision and isolating the artery by blunt dissection. After injection the vein was compressed for a few seconds to secure complete spread of the bacterial emulsion throughout the kidney.

According to the results obtained, the animals were divided into three groups:

1. Immune animals that showed only a transient renal lesion, old or at least full-grown animals evidently having a well-developed immunity.

2. Animals that died with a fulminating renal lesion and an acute general reaction, usually occurring in the young animals.

3. Animals that showed a milder renal lesion which progressed after a less severe general reaction. These animals ultimately succumbed to renal insufficiency provided the uninjected kidney was removed after the acute stage had passed.

The protocols of the various groups showed, for the first group, rapidly subsiding, acute, focal inflammatory lesions resulting in focal scars. These lesions are associated with intermittent albuminuria and cylindruria of months' duration, but no other evidences of renal insufficiency. In the second group a fulminating, acute, non-suppurative process is coupled with an acute general infection, probably focal in nature but demarcated by merely a slightly intense involvement. Here an analogy is found in acute septicæmia in the human. The progressive destruction found in the small granular kidney of chronic diffuse nephritis corresponds with the acute changes in the third group followed by rapid and extensive anatomical alteration of the renal cortex and resultant impairment in function, bringing on death after removal of the uninvolved kidney.

H. W. PLAGGEMEYER.

ROENTGENOLOGY; RADIOLOGY

Blaine, E. S.: The Caliper Method of Foreign-Body Localization. *Am. J. Roentgenol.*, 1917, iv, 544.

The method described is one devised by Fuerstenau and is one of the methods of foreign-body localization to be used by the army roentgenologists recently adopted by the medical department of the United States army. It is essentially a triangulation determination in which the mathematical calculation is rendered unnecessary by certain calibrations marked on arcs of a special caliper.

After a preliminary fluoroscopic search for the foreign body has been made to determine its

approximate location, a metal cross is placed directly above it or nearly so and in a location readily accessible to the surgeon at the time of the operation. An exposure is made with the vertical ray passing directly through the center of the cross and at right angles to the plate, the distance between anode and plate being exactly 60 cm.

The tube is then shifted 65 mm. and a second exposure made on the same plate. With the aid of the calipers, whose points are placed on designated spots of the shadows of the cross and foreign body, the location of the foreign body can be accurately ascertained by simple arithmetical calculation. Distances are indicated from the center of the cross which is marked on the skin with a stick of silver nitrate. Deviations laterally, caudad, or cephalad can be indicated by an angle indicator or protractor whose use is described.

While the above method is essentially a combined screen-plate method, it can be used with the screen alone in case of necessity. Although realizing the possibilities of errors by this method, the author believes that close co-operation between the surgeon and a skilled roentgenologist will minimize these and afford a high percentage of successful foreign-body removals.

ADOLPH HARTUNG.

Skinner, E. H.: The X-Ray in Thoracic War Surgery; a Review of Certain Recent Literature with Special Reference to Localization and Extraction of Foreign Bodies. *Interst. M. J.*, 1917, xxiv, 903.

The author reviews current medical literature relative to the expediency of early removal of bullets and shell fragments in the lungs and thorax and methods for localizing same. He finds that authors of textbooks tend toward a more conservative and expectant treatment than is noticeable in much of the war literature, more especially the French. He cites numerous authors and gives a bibliography of articles reviewed.

Attention is called to the apparent lack of use of portable roentgen apparatus close to the firing line. Regarding the localization of foreign bodies in the chest, the multiplicity of methods used is very noticeable. Some of these simply give information as to the depth of the foreign body under a given point of the skin; others permit of direct utilization at the time of operation by means of indicators. A close co-operation between surgeon and roentgenologist at the fluoroscopic table is conducive to the best results, according to the experience of numerous workers.

ADOLPH HARTUNG.

Newell, E. D.: The Value of the X-Ray to the Patient, the Surgeon, and the Railroad in All Injuries Where There Is or Could Have Been a Bone Lesion. *Internat. J. Surg.*, 1917, xxx, 305.

Cases in which injuries were apparently superficial, where the trauma was not considered adequate to cause more than a local flesh wound, have often been definitely shown on thorough X-ray

examination to present serious bone lesions, in other cases where the patient was profoundly shocked, the apparent traumatism great and the impact violent enough to produce many fractures, roentgenographic examination has proved that there were no fractures. There is no other instrument of precision in surgery or medicine that, intelligently used, gives such accurate and valuable information as does the roentgenogram in lesions of the bones and joints.

A series of illustrative cases taken from the author's records are given to show the benefit derived by the patient, the doctor, and the railroad at a small expenditure of money by the free use of roentgenography.

In all of this work the author has depended on radiographic pictures as he does not believe that fluoroscopic examinations are at all reliable in bone work. The surgeon who is to diagnose and treat these cases should be competent to read X-ray pictures if he expects to make a correct diagnosis and get the best results from his treatment. Radiograms are at times very deceptive, and one must be constantly on the alert. It is only by persistent study that one can expect to be really efficient and competent to interpret the findings.

Matolo, G. G.: Clinical Observations on Fifty Cases of Uterine Carcinoma Treated by Radium (*Osservazioni cliniche sulla radium terapia ai 50 casi di carcinoma uterino*). *Ann. di ostet. e Ginec.*, Milano, 1917, VII, 99.

The cases reported were all inoperable cases or cases recurrent after a hysterectomy. Deducting 8 cases treated too recently to give any reliable data, the author finds that among the remaining 42, 16 were clinically and anatomically cured for a period varying from one to two years. In 14 cases there was a reduction of the tumor. In 5 cases cure has not been effected, but the general state is improved. In 7 cases there is not sufficient data to establish definite results.

The conclusions drawn by the author are: (1) That direct action of radium on the neoplasm is manifested by a rapid diminution of the tumor or even by a complete disappearance demonstrable both clinically and histologically; (2) that indirect action is shown by the effect on the concomitant symptoms; pain, metrorrhagia and fetid odor disappear and there is general improvement in the condition of the patient.

In favorable cases both direct and indirect effects are concomitant. In others the indirect effects occur without reduction of the tumor. In some inoperable cases the reduction was sufficient to make possible a transabdominal or vaginal hysterectomy.

With regard to operable cancer the author thinks that radium therapy ought not to replace surgery, but that the best results will be obtained from the combination of both methods of treatment.

W. A. BRENNAN.

Neenan, N. J.: Roentgenology in Medicine and Surgery. *J. Lancet*, 1917, XXXV, 671.

The author credits roentgenology with an important rôle as a diagnostic and therapeutic agent. He considers it the duty of roentgenologists to disseminate roentgen possibilities, and gives a brief history of the roentgen ray and the development of the science of roentgenology, and finally the indications for its use in medicine and surgery, both diagnostic and therapeutic.

The advantages of chest fluoroscopy over percussion to determine cardiac and pulmonary pathology is discussed, as well as the method of action of the ray in therapeutics.

In concluding, the author mentions the value of prophylactic roentgen therapy to prevent recurrence of malignancy.

W. A. EVANS.

Manges, M.: The Roentgen Ray in the Diagnosis of Pneumonia, Pleural Diseases, and Pulmonary Tumors. *N. Y. M. J.*, 1917, CVI, 617.

The author contends that the roentgen examination in bronchopneumonia of adults is of little value. Likewise in acute lobar pneumonia, although it gives a fairly characteristic picture, its use as a routine measure is hardly indicated except in obscure cases. The roentgen studies in acute lobar pneumonia have yielded some interesting results relative to the onset, course, and termination of the infiltrating process and their relation to the clinical course and physical findings.

In the later stages when complications such as pleural effusion, empyema, interlobar abscess and abscess or gangrene of the lung are suspected, the information which may be derived from it are of the greatest value. It may make the diagnosis without subjecting the patient to the dangers and discomforts of the exploring needle. The presence of adhesions and involvement of the diaphragm can only be determined by the roentgen examination, and the differential diagnosis between pneumonia and such subdiaphragmatic lesions as subphrenic abscess is rendered easy thereby.

Regarding pleural effusions, more definite and absolute information can be obtained with it than by any other method. It has served to verify some of the current conceptions of fluid in the chest and caused others to be modified. The simultaneous presence of air, encapsulation of the fluid or limitation by adhesions can readily be ascertained. The findings with interlobar exudates are described.

Various thoracic tumors are given consideration. Pleural tumors are merely mentioned, as the accompanying massive pleural effusion usually obscures any distinctive findings. Such tumors of the lung as those due to syphilis, sarcoma, carcinoma, hypernephroma and Hodgkin's disease can usually be discovered and diagnosed with the aid of the roentgen ray. Discovery of the presence of metastatic malignancy in the lung may have an important bearing on the treatment of the primary lesion.

In conclusion the author warns against discarding the older methods of physical examination and attention to the history of the case. The roentgen examination does not furnish infallible diagnoses, and best results can only be obtained by a combination of all the available measures at command.

ADOLPH HARTUNG.

Welton, G. W.: The Value of Roentgenology in Head Injuries. *Med. Rec.*, 1917, vol. 852.

Welton believes that the majority of linear fractures of the skull are relatively unimportant; she describes one case, a transverse linear fracture over the left posterior parietal region, in which the roentgenogram, rather than the pressure symptoms, correctly indicated the site for operation.

Most interesting are cases of fracture without pressure signs. In Welton's experience about twenty per cent of skull fractures have required operation; and operative treatment is determined, not by the roentgenographic presence or absence of fractures, but by signs of increased intracranial pressure. All depressed fractures of the vault are operated upon to obviate later complications, particularly epilepsy.

DAVID R. BOWEN.

Pfahler, G. E.: The Possibilities and Limitations of Roentgentherapy in Malignant Disease. *J. Am. M. Ass.*, 1917, lxxix, 985.

The author treats the subject under the heading of superficial epitheliomata, degenerating moles and deep-seated malignant disease, which includes carcinoma and sarcoma. Under carcinoma, he further divides the subject into (a) operable and (b) inoperable deep-seated carcinoma. Deep-seated carcinoma may be inoperable because of the extent of the disease, because of some associated constitutional condition rendering the patient unfit for operation, or because the patient refuses to employ surgery.

The type of epithelioma giving the best results is the basal cell epithelioma. It is the author's opinion that practically every case of this kind can be cured by the roentgen treatment. In certain cases showing extensive tissue change, he prefers to supplement the roentgen treatment with methods to remove much of the diseased tissue, this being accomplished by electrocoagulation. Squamous cell epitheliomata are cured with greater difficulty, and a most guarded prognosis should be given. Roentgen rays should not be depended upon solely to cure epitheliomata, but electrocoagulation should be resorted to. If for any reason electrocoagulation can not be applied preceding the roentgentherapy, excision is indicated. If metastasis has already taken place, the involved glands should be removed surgically.

Degenerating moles should be removed either by desiccation, electrocoagulation or excision. The author prefers desiccation or electrocoagulation. The necessity for wide excision and complete removal is urged. Following the removal, a single full dose of

deep roentgentherapy should be given, and usually this is sufficient.

The author considers the limitations of roentgen treatment of deep-seated malignant disease great. Under the heading of operable carcinoma, he expresses the opinion that the best procedure is the surgical removal of the diseased tissue, followed by deep roentgentherapy. Apparent cures of deep-seated malignancy under roentgentherapy alone have been noted, but the number of cases is too small to justify the recommendation of roentgentherapy to the exclusion of operative procedure. The most favorable time for application of the treatment is immediately following the operation; it is the author's plan even to expose the tissues before the wound has been sutured.

In inoperable cases, where the inoperability is the result of the extent of the disease, the chief advantages consist in the healing of ulcerated areas, the absorption of large carcinomatous masses and lymphatic glands which may be making pressure on the nerves or vessels. Occasionally, the improvement in this type of case is such that an inoperable case has been transformed into an operable one. The results in the inoperable cases due to constitutional conditions or to a refusal of operative procedure depends upon the conditions, but in each case the author urges a thorough course of roentgentherapy.

Deep-seated sarcomata respond more readily to roentgentherapy, and the author considers that the majority of them can be made to disappear under this treatment. He considers roentgentherapy more satisfactory than surgery except in periosteal sarcoma, and in this type he advises strongly the postoperative roentgen treatment.

The author makes the following conclusions:

1. It is possible to cure the majority of cases of superficial malignant disease by roentgentherapy, and it is possible to cure all cases of superficial malignant disease by a combination of electrocoagulation and roentgentherapy, if applied before metastasis has taken place and deep tissues are involved.

2. Combined treatment should be used wherever the end-results will be improved, and this will apply in the majority of instances. There should be a combination of either electrocoagulation and roentgentherapy or operation and electrotherapy.

3. In the great majority of cases when the malignant disease has extended to the glands, to the bones, or to the internal organs from the breast, for example, or from the uterus, the patient cannot be permanently cured by the roentgen rays, but can, however, be greatly benefited even in advanced cases.

4. The roentgen rays with proper technique can be expected to cure the majority of cases of sarcoma, those most responsive to the treatment being medullary bone cases, sarcomata involving the soft tissues, and least of all the periosteal sarcomata.

W. A. EVANS.

Meyer, W. H.: A New Type of Rotary Mesh Filter for Use in Deep Roentgen Therapy with Special Reference to Vesical Neoplasms. *N. Y. M. J.*, 1917, cvl, 849.

By means of drawings, tests, and photographs the author covers the theoretic considerations which led to the construction of his rotary mesh filter, which has for its governing principle the aim to bring the maximum absorption rate to bear below the fourth centimeter depth. As described by him, the appliance consists of a lead mesh so constructed that the square of the covered area equals the square of the area exposed, the lead being imbedded in 3 millimeters of aluminum which acts as filter at the same time. The whole rotates on an eccentric in such a manner that the area immediately beneath the filter is alternately exposed and covered for one-half the total time. This being true, the dose can be double that with a plain filter, yet the skin receives but a single dose. Also since the effect of the mesh is practically nil beyond the fifth or sixth centimeter, in theory at least there is almost continuous exposure beyond this depth. A Coolidge tube with broad focus is essential to produce the desired results.

A summary of the effect of filtration with the author's rotary mesh filter is as follows: It results in: (1) a reduced absorption rate in the upper depths of tissue; (2) greater skin protection with the same dosage time heretofore employed; therefore, (3) the possibility of increasing the dosage time to nearly twice that generally used without further damage to the epidermis; (4) an increase in the deep transmission and absorption rate due in part to prolonged radiation as well as secondary ray effects. This does not mean a saving in time and certainly will not meet the approval of the hurry-up, homoeopathic-dose, single-area, make-them-come-often radiotherapist. (5) It means that the present-day results, as measured by deep transmission and absorption, may be attained with greater certainty because the same deep absorption and transmission rate can be brought to bear through larger and fewer areas. (6) Finally, it indicates that the efficiency of deep therapy with the popular multiple area cross-fire method may be greatly enhanced.

The list of vesical neoplasms suitable for present-day roentgen therapy, according to the author, includes: inoperable epithelioma, sarcoma, and carcinoma for palliation if not cure; prophylactic pre-operative and postoperative radiation for malignancy; and prostatic hypertrophy, where the symptoms are not acute, where palliative treatment is indicated, or where operation is not considered or refused.

The cross-fire method of deep therapy is used in conjunction with the above described rotary mesh filter. Exposures are given from the front, back, and through the perineum. Single skin areas chosen are larger than those frequently devised, to insure all of the deep area treated receiving radiation with each exposure.

ADOLPH HARTUNG.

HOSPITAL, MEDICOLEGAL, AND MEDICAL EDUCATION

Wadsworth, W. S.: Obstetric Problems and the Coroner's Office. *Am. J. Obs.*, 1917, lxxv, 222.

As coroner's physician, the author meets many problems of interest to the obstetrician. Out of 5,000 cases examined, about 10 per cent were young children and 4 per cent were women then pregnant or recently so. He calls particular attention to the obstetric factors in the deaths of women and young children. Too many fatalities are due to the obstetrician who is biased by a too intensive study of one phase of the subject at the expense of other fields. The whole sex problem in all its biologic, psychologic and sociologic bearings, together with the problems of inheritance and environment, should receive attention.

The previous local conditions of the birth canal, especially in regard to cleanliness and local disease, are important. Congenital diseases and the influences which affect prenatal life should not be forgotten. Chemical adjustments which tend to influence cellular activity begin very early in the mother. Certain drugs are harmful to lower animals in embryonal life; hence, care should be exercised in using such drugs as magnesium sulphate during pregnancy.

The problem of respiration in the newborn deserves consideration. Death at birth, in a majority of cases, is associated with some form of respiratory failure. The heart, cord, and placenta have been functioning for a long time when birth takes place; but the respiratory mechanism must necessarily assume an important rôle suddenly and maintain it continuously. Purely respiratory asthenia is often a cause of death. Rapid absorption or withdrawal of the blood from the placenta may cause sudden congestion in the lungs or other organs and result in death.

Infections of the cord often pass unsuspected. Infections of the intestinal tract from the nose and mouth, and of the female genital tract from the rectum do not receive their share of consideration. The glandular phenomena are of great importance, since the glands are greatly out of proportion to the other organs in the newborn. Thymus disease, for instance, may cause disturbance by pressure on the blood-vessels and on the trachea. W. L. BROWN.

Corwin, R. W.: The Conduction of Hospitals. *Tr. West. Surg. Ass.*, Omaha, 1917, Dec.

Among the recommendations mentioned are: improvement in the character of the staff; increase in the number of paid men on the staff; exclusion of incompetent men from operating; re-education of the doctors; strict observance of the rules of cleanliness; better co-operation between members of the staff; more skillful and better paid men in charge of laboratories.

There should be chemical laboratories for making and testing chemical substances used for patients.

All laboratories should be open twenty-four hours a day.

Internes should receive more instruction from the staff and in laboratories. Centralization of medical government, and re-education of the Board of Managers are recommended. A medical executive should serve as Superintendent.

In the conduction of hospitals, the first consideration should be given to the patient. The second consideration should be the site of the hospital. The third consideration should be the plan of the hospital buildings. It has been found that buildings of one or two stories have advantages over those of

many stories. Inclines with a grade of one foot in six meet every demand of elevator or stairs.

The fourth consideration should be the comfort and safety of the patient. Preparations against infection in the operating room are thorough; in the kitchen, they are neglected. More attention should be given to the cleanliness of food, cooking utensils, table ware, table linen and dish towels, and of the hands and clothing of the help.

Odors from medicines, drugs, or chemicals that are useless or not essential are inexcusable.

Smoking in a hospital should be forbidden.

EDWARD L. CORNELL.

MILITARY SURGERY

NOTE.—Readers are referred to the Table of Contents for other articles dealing with military surgery which appear under the various headings according to our anatomical arrangement.

Brown, T. F.: Disabilities of the War. *Med. J. Austral.*, 1917, II, 411.

The question is presented of reconstruction of men whose wounds have been healed but who have been invalidated to Australia permanently unfit. France has grasped the situation and is treating these cases by electrical, mechanical, and light methods at the Grand Palais, Paris, with remarkable success.

The author is convinced that the use of electricity and massage as usually performed, although beneficial in a number of cases, does not go far enough. He urges the establishment of an Australian clinic in England to study the following: (a) dry heat, radiant light and heat; (b) wet, whirlpool bath; (c) massage and manipulation; (d) mechanotherapy by the Zander method, isolation of muscles, and movable weights; (e) electrical methods; (f) re-education of muscles; (g) detection of malingering; (h) schemes for the formulation of a scale of gratuities according to various disabilities caused by wounds, which shall serve as a school for the instruction of officers of the Australian contingent.

D. N. EISENDRATH.

Dupont: The Employment of Adrenalin Serum in War Surgery (Notes sur l'emploi du sérum adréaliné en chirurgie de guerre). *Arch. de méd. et pharm. mil.*, Par., 1915, LXIV, 542.

The author says that most of the wounded arrive in a more or less pronounced state of shock and need some restorative before being operated upon. For some months he has used adrenalinized serum with good results. A half milligram of adrenalin is mixed with each 500 grams of serum and every patient in shock is injected with 500 grams of this mixture. As soon as he is operated upon a second injection is made and he continues to receive two injections per day for several days, but generally it is not needed after two or three days. The effects are marked

increase in blood-pressure and a more ample pulse, as well as improvement in the general condition.

W. A. BRENNAN.

Dixon, R. G., and Bates, H. T.: Treatment of Wounds by a Solution of Soap in the Casualty Clearing Station. *Lancet*, Lond., 1917, CCXIII, 789.

This dressing has been used in 368 cases. During the same period similar cases have been treated with other antiseptics, including eusol, hydrogen peroxide and bipp, with the result that more soap is being used and less of the other antiseptics.

A sample of common yellow soap was analyzed and found to contain: water 24.6; fatty acids 63.0; combined alkali 4.6; free alkali, 0; impurities 7.8 per cent. This was considered suitable, and it was found possible to make a two and a half per cent solution of it.

The points claimed for the soap solution dressings are that they cleanse wounds quickly, the dressings are much less painful than ordinary ones, there is a saving of labor as the dressings need only be changed every three or four hours, and the solution is easily procured, easily made, and cheap.

EDWARD L. CORNELL.

Nové-Jossierand and Tuffier: The Functional Results in War Articular Resections, 1914-1916 (Sur les résultats fonctionnels des résections articulaires en chirurgie de guerre, 1914-1916). *Arch. de méd. et pharm. mil.*, Par., 1916, LXVI, 148.

The authors' report is based on statistics and information furnished by various orthopedic hospitals in France. There were 107 reports containing 1,850 cases of resection. Of the total resections, 1,132, or 60 per cent were of the upper limb and 40 per cent of the lower. This proportion is the inverse of amputations, more than 60 per cent of amputations being in the lower limb, and the figures confirm the view that the upper limb is more amenable to conservative operations than the lower.

The value of resection of the upper limb is seen from the fact that the number of deaths is only about 3 per cent. In the case of the hip and knee, resection shows 35 per cent of failures.

The time at which the resection was performed must also be known. Of 109 knee resections there were 36 within the first 3 days after injury, giving 33 recoveries and 3 deaths; and 73 secondary or late resections with 45 recoveries, 20 amputations and 15 deaths.

Detailed tables are given showing the functional values of limbs after various resections. In a general way the results show that articular resections give a useful limb. In the upper limb and foot the result is obtained by reconstruction of a solid joint with limited movements, which is superior to amputation. In the knee and hip, ankylosis in a good position is the favorable result. Use of the limb with the aid of an apparatus is obtained.

Although the general results are fair, they are much inferior to those obtained from resection in civil life, and this is accounted for by greater frequency of infection.

The author's conclusions based on the evidence afforded are as follows:

Resection is indicated (a) as a means of early disinfection of articular wounds; (b) for drainage of suppurating arthritis; (c) in the treatment of chronic fistulous osteo-arthritis consecutive to articular wounds; or (d) as an orthopedic operation.

In a general way resection assures a rapid and definite recovery, when done early; but from a functional viewpoint the result is less satisfactory when the operation is performed early than when it is late.

In suppurative arthritis resection has given good results for all articulations except the knee. For the knee-joint statistics show 52 per cent of failures, and opinions as to treatment are divided.

The authors discuss the question as to whether better functional results cannot be obtained by improvement of the operative technique. The causes of defective articulations and ankyloses are to be traced to (a) the extent of the resection; (b) the destruction of the periosteocapsular sheath; and (c) muscular insufficiency.

As regards the correction of defective end-results, the authors refer to the various kinds of orthopedic apparatus in vogue which give marked relief; also to certain operated cases which offer a possibility of satisfactory surgical treatment of defects.

W. A. BRENNAN

Cathelin, F.: The Urinary Surgery of War (Chirurgie urinaire de guerre). *Arch. de méd. et pharm. mil.*, Par., 1918, LVII, 11.

Cathelin lays down some fundamental rules to be observed: (1) the use of cystoscopy in wounds of the lower pelvis; a routine systematic cystoscopic examination should be made in all penetrating wounds of the lower pelvis; (2) ureteral catheterization in kidney injuries, (3) the treatment of in-

continence by epidural injections; (4) the use of autoplasmic methods; (5) the advantages of internal urethrotomy, (6) the need of laboratories for the various urinary examinations and others that may be necessary.

The idea which dominates all urinary surgery of war is that of conservation; not a blind conservation, but that which a clear-seeing surgeon can map out.

The author has treated 26 cases of war traumatism of the kidney and bladder and 15 hemibulbar injuries with or without sphincter troubles, paraplegia or external wounds. Four special cases are given in detail, also 12 bladder injury cases.

Twenty-two cases of mutilating injuries of the external genito-urinary organs have also been treated. Fourteen were treated by autoplasmic methods, 5 recovered without intervention and in 3 external urethrotomy was necessary. Cathelin gives very full details of the various procedures to be followed in these autoplasmic operations. Such autoplastics are difficult to execute and require an experienced genito-urinary specialist accustomed to this kind of operation.

W. A. BRENNAN

Boyle, H. E. G.: The Use of Nitrous Oxide and Oxygen with Rebreathing in Military Surgery. *Lancet*, Lond., 1917, CCXIII, 667.

The author relates his experiences in 711 cases administered by himself and others. Of 530 cases administered by himself, 38 per cent had had either ether or chloroform-ether mixture. There were no fatal cases.

Boyle attempts to procure a more extended use of gas and oxygen with regulation of rebreathing in major surgical procedures and especially in treating military wounds. He is quite convinced that this is an advance over other methods of anaesthesia, and from the patient's point of view is infinitely a better way than ether or chloroform. He gives a word of warning, however, that the combination anaesthetic is not to be placed in the hands of the careless or the inexpert.

F. C. ROBERTSON

Conclusions Adopted at the Third Session of the Interallied Surgical Congress (Conclusions adoptées à l'issue de la troisième session du congrès chirurgical interallié). *Bull. méd.*, Par., 1917, XXVI, 436.

The following conclusions were adopted at the close of the Third Session of the Interallied Surgical Congress held recently:

Secondary and late complications of brain wounds:

1. Collected evidence in literature shows that if secondary complications of cerebral wounds are relatively frequent, late infective complications are much more rare than was supposed.

2. Organic disturbances consecutive to wounds of the brain, hemiplegias, monoplegias, aphasia, etc., have frequently a tendency to improvement. Their treatment is in the domain of neurology.

3. Late epileptic seizures of jacksonian type can be benefited by surgical intervention, removal of the compressing cause, or of the foreign body or projectile fragments. It is useless to intervene for one or two isolated seizures of jacksonian epilepsy, because they may be due to the onset of encephalitis, susceptible to recovery, and on which surgical intervention would have no influence. Outside of cases where a foreign body or fragments exist, epileptic seizures do not call for surgical intervention. In cases of hypertension, lumbar puncture of the cerebrospinal fluid, controlled by the manometer, may be useful.

4. Late cerebral abscesses, diagnosed and differentiated from non-suppurating encephalitis, should be operated upon after the precise clinical location made by the surgeon and neurologist. After exploratory puncture, without destruction of its protective adhesions, the abscess should be opened and asepsis maintained.

5. Late localized meningitis and encysted abscesses of the meninges must be operated upon.

6. The actual treatment of generalized meningitis is generally ineffective. Repeated lumbar punctures appear to be the most rational treatment.

7. Cerebral hernias with abscess should be operated upon and the abscess drained. It appears preferable to abstain from lumbar puncture in the primary acute feverish phase of certain cerebral hernias. To avoid the spread of a possible local infection when the infective processes have diminished, lumbar puncture by decreasing hypertension will favor reduction of these hernias. Resection of the hernias is only justified in the case of local necrosis or of meningocele.

8. Intracerebral foreign bodies causing encephalitis, epileptic seizures, or an abscess, should be extracted. Well-tolerated foreign bodies should be allowed to remain.

9. Cranioplasty is indicated from the æsthetic point of view, especially in the losses of substance of the frontal region. From the curative point of view it is only justified in cases in which the extent of the cicatrix is the only cause of complications observed. From the prophylactic point of view the danger of an ulterior cranial traumatism in the trepanned region can become an operative indication. In all cases there must be assurance that nervous complications, chemical or cytological modification of the cerebrospinal fluid, or papillary stasis, is not a counter-indication to intervention.

10. Early treatment, systematic disinfection, and primary sterilization of the traumatic intracerebral areas are the best prophylactic treatment of secondary infective complications.

End results of the treatment of diaphyseal fractures of the thigh:

1. Generally the end-results of the treatment of thigh fractures have been poor, due to the extent of the injuries, to the insufficiency of the resection and especially to infections of the area.

2. The end-results of fractures of the upper third and especially of the lower third of the femur are the least satisfactory.

3. The most frequent late complications are: (a) infections under the form of chronic osteomyelitis; (b) deformities due to incomplete reductions; (c) less frequently, defects of consolidation or functional impotence of articular, muscular, or nervous origin.

4. Shortening is the most frequent deformity and is the least avoidable.

5. Rotation and angulation are most frequently due to insufficiency of surgical supervision.

6. Surgical asepsis should be the chief aim. Its insufficiency is the direct or indirect cause of the resulting defects. The delays and difficulties in the treatment of prolonged infections render the approximation of the fracture fragments more arduous.

7. Primary suture of the wound and secondary suture after cicatrization transform an open into a closed fracture and have an important influence on the end-results of the treatment of thigh fractures.

8. The frequent stiffness of the knee as well as of the hip and foot, isolated or associated, may be prevented by early mobilization.

9. Muscular adhesions are the starting point of numerous functional disturbances, which may call for surgical intervention.

10. Trophic disturbances, muscular atrophy, œdema, and vasomotor trouble play an important part and ought always to be the object of early and persistent attention.

11. Marked deviations with or without osteomyelitis demand osteotomy. Where there is a concomitant osteomyelitis, resection of the callus is generally indicated.

Operations for nerve injuries:

1. Nerve operations as a result of war lesions have up to the present time given relatively poor end-results. Partial lesions have a higher percentage of good results than total lesions.

2. The poor results are especially due to delayed intervention.

3. Operations should never be done in a suppurating area.

4. The three principal causes for lack of success in operations on the nerves are: (a) sclerosis of the periphic end, which increases with the lapse of time; (b) very considerable separation of the two ends; (c) intensity and duration of suppuration.

5. Tendinous retractions, articular ankyloses, and ischæmic muscular sclerosis, all tend to effectively diminish the value of the functional results. It is necessary from the very beginning to place the articulation in an appropriate position.

6. Primary suture of nerves, which the present-day methods of wound disinfection make possible, is calculated to considerably improve results from the viewpoint of the frequency, rapidity, and amount of functional recovery.

7. Even in cases where there is no success, primary suture keeps the nerve extremities in such

a condition that a fresh intervention is made very much easier.

8. Functional recoveries are slowly produced. They require months and even years, which should be taken into account in assessing damages.

Treatment of joint fractures:

1. The aseptic course of early operated osteo-articular lesions, with the average delay of from 10 to 12 hours, indicates that maximum preservation will result from intervention.

2. Epiphyseal or epiphyseometaphyseal comminutive fractures, i.e., trabecular fractures, incomplete perforations, etc., according to present knowledge justify surgical clearance and curettage followed by primary closure of the joint.

3. Epiphyseal or epiphyseometaphyseal fractures, either partial or T, according to the case, call for arthrotomy with reduction or arthrotomy with economic clearing, i.e., partial atypical resection, followed by primary suture.

4. Primary resection is only exceptionally indicated by the bone lesions. It will be limited to comminutive fractures of the articular extremities. However, its indications are wider in the case of the hip and shoulder than in the case of the knee, elbow, and instep. In debatable cases to obtain a better functional result, more conservative methods should be followed, i.e., arthrotomy with clearance, partial atypical resection.

Defective functional results will justify late orthopedic resection, the quality of which will generally be superior to that of primary resection.

5. Crushing injuries with destruction of the principal arterial trunk indicate primary amputation.

6. Immediate mobilization should follow operative treatment and seems to have given better results than immobilization.

7. Resection is indicated in infected joint fractures.

Treatment of chronic osteomyelitis:

1. Bone infection is produced in the same way as infection of other war wounds. It spreads in two ways: (a) from place to place through the medullary and compact tissue; (b) at a distance, along fissures; penetration through the bone tissue is generally slow and limited.

2. Among the germs which penetrate earliest may be cited the streptococcus, the staphylococcus,

the enterococcus, and more rarely the anaerobic microbes. In the microbial flora of subacute or chronic bone suppurations the most frequent are the streptococcus, staphylococcus, enterococcus, and pneumobacillus.

3. The treatment of chronic osteomyelitis is essentially preventive, and does not differ from the treatment of the fracture area.

4. The treatment of established osteomyelitis is at the present time purely surgical. It ought to be early. It consists essentially in: (a) wide opening up of the area; (b) minute search for and removal of all sequestra and foreign bodies; (c) filling all cavities.

5. When this is done there are two courses to follow. Either immediate closure of the wound should be made, this being filled by autoplasmic strips, or chemical sterilization of the wound with secondary autoplasty for filling the bone cavity, and suture. The latter method is that most generally followed.

Thoraco-abdominal wounds:

1. Wounds of the diaphragm are the deciding factor in thoraco-abdominal injuries; wounds of the thoracic and abdominal organs show nothing unusual from the anatomic point of view.

2. Hernia of the abdominal organs is difficult to recognize clinically. Radioscopic examination by showing displacement of the heart to the right is a diagnostic sign which should be noted, especially for the left hemithorax.

3. The operative indications are almost absolute, except in cases where a very small projectile involves only the higher part of the abdomen, especially to the right.

Outside of any operative indications in the thorax and abdomen, the perforation of the diaphragm calls for suture.

4. Intervention by the transpleural thoracic route has many advantages in permitting inspection of the lesions, treatment of the pleural cavity, and suture of the diaphragm. It also permits treatment of the subdiaphragmatic organs, whether herniated or not.

5. The association of a separate laparotomy may be indicated.

6. Thoracolaparotomy permits extensive treatment of both thoracic and abdominal lesions by a single route.

W. A. BRENNAN.

GYNECOLOGY

UTERUS

Guthrie, D.: Factors of Safety in Abdominal Hysterectomy. *Penn. M. J.*, 1917, xxi, 65.

Guthrie records 373 hysterectomies during the past 6 years, with a mortality of 1.3 per cent. The surgeon should know the exact physical condition of the patient. Those who have suffered from severe metrorrhagia should be operated upon just before the onset of the next period, giving the body a chance for recuperation. Efforts should be made to control metrorrhagia by salines, tonics, and other measures. If the hæmoglobin is reduced to 40 per cent and the bleeding cannot be controlled, direct transfusion of blood is advised. To prevent postoperative shock due to loss of sleep and dehydration, nervous patients are allowed to rest in the hospital for a few days prior to the operation.

Laxatives are given early in the afternoon of the day before the operation. Castor oil as a mechanical agent is the one of choice. To prevent loss of fluid from the body, the patient is not wrapped in blankets, the operating table is not kept warm, and the operating room is kept just at normal temperature. In all cases of hysterectomy the patients are shaved in the afternoon and the abdomen treated with tincture of iodine. This is repeated just before operation. In addition the vagina is washed out with soap and water and a 1 to 5,000 bichloride douche is given. This is repeated on the table in cases of complete hysterectomy.

Good anæsthesia by a competent anæsthetist in the Trendelenburg position from the beginning is very important. This position keeps the small intestine out of the pelvis when the abdomen is opened. When the peritoneum is opened, lifting up of the abdominal wall with two fingers inserted into the abdomen will facilitate the sliding back of any coil of intestine that might have gravitated downward. Much less gauze is required for exposure, and traumatism to the small intestine is lessened.

If there is no pelvic infection, the gall-bladder is palpated and if necessary, attended to. The appendix is always removed, unless the condition of the patient is critical.

The clamp method for the hysterectomy is used. The cervical canal is wiped out with gauze wet in bichloride. No strong antiseptic is used for fear of causing sloughing and subsequent intestinal adhesions. The other steps of the operation are described and illustrated by charts.

The author urges the surgeon to give frequent personal attention during the postoperative course. The patient must also be watched carefully for the

first few days and plenty of fluid administered, by bowel and mouth. Very little morphine is used, usually one-sixth of a grain before the operation. In postoperative atony of the stomach, lavage every three hours with hot water is used. For ileus and retention of urine pituitrin is given successfully. Catheterization is avoided.

No postoperative hæmorrhage has ever occurred. The uterine vessels are ligated after fixing the ligature along the side of the cervix by a safety tie and then securing the vessels firmly by another tie of the same ligature. The vessels in the broad ligaments are secured by a safety tie, then a lock suture throughout.

L. R. GOLDSMITH.

ADNEXAL AND PERIUTERINE CONDITIONS

Novak, E.: Hæmatomata of the Ovary. Including Corpus Luteum Cysts. *Bull. Johns Hopkins Hosp.*, 1917, xxviii, 349.

The material upon which this study is based was derived from 85 cases in which one or both ovaries had been removed at operation. Some of these ovaries contained only one hæmatoma, some a great many. The selection of this material was made relatively simple by the obviousness of hæmatomata on naked eye examination. In all cases the ovaries were cut into at various planes, for the surface appearance of an ovary is of little importance as an index of its internal structure.

The study has aimed to include all hæmorrhagic lesions encountered, so that the series includes small follicular hæmorrhages as well as the larger hæmatomata of pseudo-neoplastic type. In other words, it was not limited to the comparatively small group in which the blood tumor was so large as to give rise to the symptoms which indicated operation. By far the largest proportion of hæmatomata studied, as a matter of fact, were quite small, not exceeding 2 cm. in diameter. These smaller lesions, the author believes, afford a much better opportunity than the more extensive ones of solving the important question of pathogenesis. The largest hæmatoma in his series measured 6 cm. in its longest diameter. Larger ones than this are relatively rare.

In investigating the material, the author was impressed by the fact that in the overwhelming proportion of cases hæmatomata of the ovary are the result of hæmorrhage into the follicular structures, including the corpus luteum, which is a derivative of the graafian follicle.

Novak summarizes his study as follows:

In the overwhelming majority of cases hæmatomata occur in connection with the follicular

structures of the ovary, although occasionally they may be the result of hemorrhage directly into the ovarian stroma. They are best classified as of the follicular, corpus luteum, or stromal type.

The first-named group, i.e., the follicular, comprises those due to hemorrhage into the maturing graafian follicle and those due to bleeding into the atretic follicle. The latter form is the most frequent of all, representing the common clinical type of follicular hematoma. In the follicular type, the source of the hemorrhage is definitely traceable to the vascular ring surrounding the follicle. Such hemorrhages are primarily perifollicular and therefore stromal, but when sufficiently great they break through into the cavity of the follicle, forming either large or small hematomata.

The corpus luteum hematoma is also very common, being distinguished by its yellowish wall of lutein tissue. The various clinical types of corpus luteum cysts are explainable by reference to the normal life history of the corpus luteum. The latter, like the growing graafian follicle, may be arrested at almost any point by the occurrence of excessive bleeding into the cavity. This is especially common during the stage of vascularization, in which a moderate amount of bleeding into the corpus lumen takes place as a normal phenomenon.

Stromal hemorrhage, or "apoplexia ovarii," is not frequent, occurring most often in the course of infectious diseases, or with severe local inflammatory lesions. It has, however, been observed in the fetus and in the very young child.

A careful study of the menstrual histories of the cases on which this paper is based shows that the hemorrhage which causes follicular hematoma occurs characteristically at or near the supposed time of ovulation, i.e., between the seventh and sixteenth days of the menstrual cycles. The bleeding of corpus luteum origin, as might be expected, occurs later, being apparently only an exaggeration of that normally occurring in the stage of vascularization, and there is no characteristic menstrual history associated with the presence of hematomata in the ovary.

GEORGE E. BEILEY.

McKay, H. S.: *Tubo-Ovarian Infections*. *J. Missouri St. M. Ass.*, 1917, xiv, 423.

A careful study of the etiology of the infection is essential to the proper management of tubo-ovarian infections. The operative treatment in many instances will be largely influenced by the proper understanding of the etiology. The causative agent can most frequently be ascertained by a careful history and the location of the pathologic lesions. In pelvic infections due to streptococci the possibility of metastasis from distant foci must be considered. The history of childbirth infections, abortions, instrumentation, curettage, lacerated perineum or cervix are significant and indicate an infection of streptococcal origin. A previous urethritis, irritating leucorrhea and a former Bartholinitis points to a gonorrheal infection.

The location of streptococcal pelvic lesions is usually in the connective tissue area and in the broad ligament, low down beside the cervix. The tubo-ovarian mass is higher up and does not blend with the pelvic wall and uterus as does the mass in the streptococcal infection.

No case should be operated upon in the acute stage, as Simpson, Clark, and others have long ago shown.

In the acute cases coming to the author's service, the following routine treatment is followed out. A blood count and an examination sufficient to determine the condition is made; the patient is placed in bed in the Fowler position, a large ice bag to the abdomen, continuous saline proctoclysis instituted and morphine sulphate, one-sixth of a grain, is administered every five hours to obtain and maintain intestinal quiet. All foods and liquids are withdrawn by mouth. Nearly all cases become quiescent in about forty-eight hours.

Operation is undertaken after the patient has been normal ten days or more. A few cases have been operated upon in the acute stage when there was considerable doubt about diagnosis, and the Coffey quarantine pack used with great satisfaction.

Decision as to what should be removed and what allowed to remain has to be decided by the pathology present and a consideration of the individual case. In the event that both ovaries must be sacrificed, the uterus and cervix are usually removed, particularly in gonorrheal infections. This eliminates the possibility of further distressing discharge from either uterus or cervix.

EXTERNAL GENITALIA

Cullen, T. S.: *Adenomyoma of the Rectovaginal Septum*. *Bull. Johns Hopkins Hosp.*, 1917, xxviii, 343.

The condition is described as follows: "Adenomyoma of the rectovaginal septum is a diffuse growth consisting of non-striated muscle and fibrous tissue with large or small areas of mucosa identical with the mucosa of the body of the uterus scattered throughout it. This mucosa swells at the menstrual period and as there is usually no escape for the blood, the gland spaces tend to become cystic and are filled with blood; or there is hemorrhage into the matrix of the tumor. The tumor in the beginning is very small and starts in the vaginal vault just behind the cervix, or it may be recognized as a round or irregular thickening, not over 1 cm. in diameter, behind and usually attached to the cervix. The growth gradually spreads in a diffuse and irregular manner, involves the adjacent anterior rectal wall and spreads into one or both broad ligaments, until, finally, everything in the pelvis may be firmly glued into one mass."

In a previous paper Cullen made a tentative classification. This grouping, he believes, may be retained until our knowledge of the subject has been augmented. The classification with the num-

ber of cases brought up to date is as follows: (1) small adenomyomata lying relatively free in the rectovaginal septum; (2) adenomyomata adherent to the posterior surface of the cervix and at the same time to the anterior surface of the rectum; (3) adenomyomata gluing the cervix and rectum together and spreading out into one or both broad ligaments; (4) adenomyomata involving the posterior surface of the cervix, the rectum and broad ligaments, and forming a dense pelvic mass that cannot be liberated.

As can readily be inferred, the symptoms will in general depend upon the manner in which the growth extends. When small, it occasions little trouble. Extension to the rectum may or may not be followed by pain. Implication of the pelvic nerves in the diffuse growth may cause much neuralgic pain, and encircling of the ureters by the growth may bring about unilateral or bilateral hydro-ureter with renal pressure symptoms at the menstrual period.

Menstruation in some cases occasions much pain.

If the mucosa of the growth has projected into the vagina, there will be an escape of menstrual blood from the posterior vaginal wall at the catamenial period, as was noted by the author in one case in which the patient menstruated, although her uterus had been removed two years before; and in those cases in which the glands of the adenomyoma extend through to the rectal mucosa there will naturally be some escape of menstrual blood from the bowel at the period.

In all of the previous cases the tumor occurred during menstrual life. The four cases recorded by the author in this paper offer no exception to the rule. The patients were 28, 37, 27 and 43 years of age respectively. Cullen states that nothing is known as to the origin of these tumors, but it is certain that their glandular elements are identical with those of the mucosa of the body of the uterus.

The article is profusely illustrated with drawings by Broedel and by microphotographs.

GEORGE E. BEILBY.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Williams, J. W.: A Histologic Study of Fifty Uteri Removed at Caesarean Section. *Bull. Johns Hopkins Hosp.*, 1917, XXVIII, 335.

During the past twenty years the author states that in his service in the Johns Hopkins Hospital they have had occasion to amputate the body of the uterus supravaginally and to treat the stump extra-peritoneally in 50 cases following delivery by caesarean section. In each instance the specimen was preserved and subjected to careful histological examination.

The study of this comparatively large material yielded important information concerning a number of questions; more particularly concerning the mechanism of the separation of the placenta and of the fetal membranes; the amount of decidua retained immediately postpartum; the vascular changes at the placental site; the retraction of the uterine muscle; the occurrence of ascending infection in patients who had been long in labor, or who had been repeatedly examined by persons neglecting rigorous hand disinfection; and finally concerning the characteristics of the cicatrix resulting from previous sections, and its bearing upon the correctness of the dictum, "once a caesarean, always a caesarean."

The author believes that a brief analysis of his findings will prove of interest, more particularly as they were not in accord with certain current teachings; they show that many of the statements concerning the third stage of labor contained in the textbooks are too arbitrary and general.

The operation was resorted to in many patients who required a second or third caesarean section, as well as in those suffering from serious heart lesions, in whom a repetition of pregnancy bid fair to jeopardize the patient's life, and in the case of certain feeble-minded or profoundly deformed individuals in whom repeated pregnancy seemed undesirable from an economic or social point of view.

Analysis of the series of cases shows that operation was undertaken for the following indications: repeated caesarean sections, 10 cases; frank infection, 8 cases; rupture of the uterus, 5 cases; serious heart lesions, 4 cases; stenosis of the cervix, 3 cases; intramuscular hemorrhage associated with premature separation of the placenta, 3 cases; myoma of the uterus, 3 cases; atonic hemorrhage, 2 cases; pregnancy in a rudimentary horn, 1 case; a total of 37 cases, leaving a balance of 13 cases in which the operation was undertaken for various other indications. The author acknowledges that

supravaginal amputation may have been unnecessary in a small number of the latter group of cases, but for the great majority he contends that it was a fully justifiable procedure.

Before the author takes up the analysis of the histological findings he considers in detail the structure of the pregnant uterus at term, of the placenta, and of the membranes outside the placental site.

His study showed that hard and fast rules cannot be laid down concerning the line of cleavage during the third stage of labor or concerning the amount of decidua which will be retained at the placental site or elsewhere in the uterus. In some cases cleavage occurred definitely in the spongy layer, less frequently in the compact layer, but very often it was irregular, involving the spongy layer in some places and the compact layer in others. Consequently the amount of decidua retained varied greatly in different specimens, and all gradations were observed, varying from a thick layer on the one hand to minute decidual triangles between the serrated margin of the muscularis on the other.

The author refers to the fact that in not a few specimens it was impossible to locate the placental site macroscopically, and that its location could only be established after microscopic study. In such cases neither the amount of decidual tissue retained nor the increased vascularity enables a decision to be made, which in the author's experience depended almost entirely upon the recognition of fetal cell infiltration or of certain vascular changes, which only occur in this locality.

In considering the structure of the full term pregnant uterus, attention was directed to the excessive thinness of its muscular walls, and to the fact that their fibers had lost the felt-like structure characteristic of early pregnancy and had become arranged in almost parallel strands. Coincidentally with the emptying of the uterus at the time of labor and the great increase in the thickness of its walls, the arrangement of the muscle fibers underwent immediate change, and microscopic examination showed that the individual muscle cells had become considerably diminished in length and increased in thickness. Coincidentally with this change the muscle bundles lost their more or less parallel arrangement and pursued an irregular and complicated course. In many instances the fibers were markedly curved, suddenly bent at acute angles, and in general interlaced in such a way as to make it impossible to describe their course.

In 8 instances the indication for the removal of the uterus consisted of frank intrapartum infection. In all of these cases, microscopic examination

revealed the existence of acute inflammatory changes in the decidua. In every instance the process was most intense in the lower uterine segment, thus indicating that the infection had ascended from below. In a number of instances the placental site was involved in the process, and there was every probability that a considerable number of the patients would have presented severe, if not fatal, infection in the puerperium had the uterus not been removed, and thus additional evidence is afforded of the wisdom shown in adopting a radical course. In addition to the eight cases mentioned, definite inflammatory changes were noted in 12 other specimens. These were all derived from patients who had been examined by outside physicians before admission to the service, or in whom for one reason or another interference had been deferred until late in labor. In a number of these specimens appropriate methods of staining enabled the author to demonstrate the presence of streptococci in the tissues, but in others, such bacteriologic evidence could not be adduced.

The author considers the fact very impressive that inflammatory changes were present in 40 per cent of the specimens, and it serves to demonstrate anew the dangers of conservative cesarean section when performed at any other than the optimal time, namely, at an appointed date during the last days of pregnancy or within a few hours after the onset of labor in patients who have recently been examined by an appropriate technique. In this group of cases, at least, he feels that the disadvantages incident to permanent sterilization have been more than compensated for by the increased saving of maternal life resulting from the radical operation.

In this series of specimens are included 10 uteri which had already been subjected to cesarean section upon one or more previous occasions, and it is interesting to study the cicatrix in connection with the frequently made statement that it always constitutes a *locus minoris resistentiæ* and thus affords justification for the dictum, "once a cesarean, always a cesarean." In eight of the specimens, one of which had been subjected to two and another to three previous sections, it was difficult to find the old cicatrix by examination with the naked eye, and the only indication of its existence was afforded by the presence of slight vertical depressions upon the external and internal surfaces of the uterus. In these specimens microscopic examination revealed the entire absence of scar tissue in the uterine wall and showed that the muscle fibers extended across the site of the old incision as if it had never existed. In other words, examination showed that following the section, the uterine wall had been restored to its integrity, and that it offered little more chance for rupture than if a previous operation had not been performed. It is interesting to note that in this series of cases the convalescence from the previous operation had been uneventful and uncomplicated.

The author believes that the evidence at his

disposal indicates that the healing of cesarean section wounds is generally satisfactory, provided that the convalescence has been normal, and ordinarily does not call for a repetition of the procedure unless definitely indicated by the existence of extreme disproportion or some other condition. On the other hand, in patients in whom the convalescence has been abnormal, it is probable that the cicatrix will be greatly thinned out and will offer a *locus minoris resistentiæ*. In such cases, a repeated cesarean section may be indicated for the express purpose of avoiding a subsequent rupture. His experience, however, showed that this is not inevitable and that even should it occur, satisfactory results should follow prompt operation.

For practical purposes, therefore, he concludes that the behavior of the cicatrix can be regarded with equanimity provided the previous convalescence has been normal, but when it has been disturbed there is a reasonable probability of the occurrence of rupture, and such patients should be kept under the closest observation during the last months of a succeeding pregnancy.

GEORGE E. BELLBY.

LABOR AND ITS COMPLICATIONS

Zinke, E. G.: *The Causes and Surgical Aspect of Rupture of the Uterus During Labor*. *Tr. South. Surg. Ass.*, St. Augustine, 1917, Dec.

The most frequent cause of rupture of the uterus is a prolonged second stage of labor, due to an obstruction of either maternal or fetal origin. The appearance of the contraction ring is the most significant sign of an impending rupture of the uterus.

When rupture of the uterus is not the result of an imperfectly united cesarean scar, extirpated tube, myomectomy, etc., but is solely the consequence of an obstruction, its clinical picture is clear and definite. The symptoms are easy of recognition, and the rupture may be anticipated and promptly diagnosed if the attendant is upon the scene at the time.

The management of rupture of the uterus during parturition differs according to the completeness or incompleteness of the rupture, the amount of hæmorrhage, the condition of the mother, and according to whether the patient is in a hospital or at home. If the rupture is incomplete, the child may be extracted *per vaginam* if the hæmorrhage is not severe or when the patient is in her home; if the patient is in a hospital, an abdominal section, quickly performed, may save both lives even if the loss of blood has been great. If the rupture is complete, and the child is alive and vigorous, an immediate abdominal section is indicated, no matter what the condition of the mother, or whether she is at home or at a hospital. If the child is dead, and the mother's condition is hopeless, it is of no avail to interfere surgically under any circumstances. If the child is dead, and the mother's condition fairly promising, the child should be at once de-

livered through the abdomen, and the rent in the uterus and peritoneum repaired; or, if an infection exists, a hysterectomy should be performed. It is understood that this latter treatment promises little for the mother when it must be carried out at home, but that her life may often be saved if the operation is performed in a hospital.

PUERPERIUM AND ITS COMPLICATIONS

Hirst, B. C.: The Treatment of Puerperal Pyæmia. *Surg., Gynec. & Obst.*, 1917, XXX, 452.

Hirst was formerly opposed to operative treatment for pelvic thrombosis, first, because of the difficulty in diagnosing the condition; secondly, because he considered the thrombosis a conservative action on the part of nature which should not be disturbed; and thirdly, because nothing apparently could have been gained in all his cases operated upon abdominally for puerperal infection during the past twenty-five years.

He gives a brief history of 37 cases of different types of infection operated upon in the last five years. While the abdominal incision offered a good opportunity for observation, there seemed to be no case which would gain by the ligation of the pelvic veins. Also the mortality has been exceedingly high in such operations. The author now considers operative treatment more favorably and will look for symptoms of pelvic thrombosis in cases of puerperal pyæmia.

Among 37 cases operated upon at the maternity clinic there was 13.5 per cent mortality. The indication for operation in practically all cases was the presence of a pelvic mass, with the history of infec-

tion. Two cases had general peritonitis and were hopeless. The location of pain was as follows: in the left lower abdomen in 13 cases; in the right lower abdomen in 6; in the bilateral lower abdomen in 11; location not given in 7. The time intervening between delivery or miscarriage and operation ranged from three days to five months; in the majority of cases the interval was from one to three weeks.

L. R. GOLDSMITH.

Alcorta, R. H.: Postpartum Hemorrhage and Its Treatment (Las hemorragias del post-partum y su tratamiento). *Arch. de ginecop. obst. y pediat.*, Barcelona, 1917, XXX, 231.

To combat postpartum hæmorrhage, Alcorta says three procedures are available: the elastic ligature of the trunk, or the method of Ribera-Momburg; Duerrhsen's utero-cervico-vaginal tamponade; and blood transfusion.

The elastic ligature of the trunk is only an adaptation of the method of aortic compression first put into practice by Ribera and then perfected and generalized by Momburg. It consists in effecting compression of the abdominal aorta indirectly by means of a band or tube of rubber twisted strongly around the waist and providing a constriction which effects hæmostasis in all parts of the body situated below the ligature. It may be practiced with or without anæsthesia. The method was first applied in 1910 for hæmorrhage due to placenta prævia.

In the majority of cases the author thinks that Duerrhsen's tamponade suffices to stop the loss of blood. Blood transfusion not only has an important hæmostatic value, but also has an admirable effect on the general state.

W. A. BRENNAN.

GENITO-URINARY SURGERY

KIDNEY AND URETER

Chetwood, C. H.: Renal Misplacement, Renal Haematuria and Renal Infection. *Am. J. Surg.*, 1917, xxxi, 273.

All kidneys are movable, physiologically, in a vertical plane, varying in normal limits sometimes as much as five centimeters. Movability in a horizontal plane is more apt to give rise to symptoms. The severity of symptoms does not bear a direct ratio to the degree of mobility. Various causes for undue mobility have been ascribed, the chief cause being the absence of fibrous tissue bands by which the kidney is attached to the back of the abdominal cavity. The author finds from the examination of a series of cases that 50 per cent complained of pain alone, suggesting kidney distension. In over 10 per cent there was evidence of actual obstruction producing stasis in the form of hydronephrosis or pyelitis. In over 5 per cent there was added infection. In 33 per cent there were gastrointestinal disorders.

The symptoms of misplaced kidneys may be divided into: (a) those produced within the organs themselves, and (b) those produced in adjacent organs and other parts of the system.

The first and most likely local result is acute congestion due to torsion of the kidney upon its vessels and upon the ureter, and thereupon follows the sequence of acute hydronephrosis with the symptoms of Dietl's crisis.

Another result of torsion is haematuria, transient or more or less permanent, depending upon the degree and persistence of the torsion. Interference with renal circulation causes congestion and, according to the extent of the latter, tension, ecchymoses, and the appearance of blood in the urine.

The extrinsic causes may be summed up as all of those causes that produce obstruction to the blood supply and to the urinary outflow, i.e., renal mobility and torsion, external growths, and abnormal blood-vessels. The intrinsic causes of renal haemorrhage are assumed to be dependent upon renal congestion. Renal congestion predisposes to infection and kidney mobility has a relationship to both haemorrhage and infection.

Every movable kidney is a latent source of infection, the degree of which depends upon the nature of the latter and the susceptibility of the tissue. The practical deductions from the interrelationship of renal mobility, haemorrhage and infection are as follows:

In the case of movable kidney, if there be no interference with circulation or the flow of urine, no symptoms are likely to be produced in the kidney.

Pain is an indication of renal distension.

Descent alone, of the kidney, is not sufficient to produce symptoms growing out of interference with blood supply or urine outflow. There is usually added the element of torsion or external pressure as a determining cause of symptoms.

Interference with emptying of the pelvis of the kidney as in the bladder is a frequent contributing factor toward infection, or hindrance to the cure of an existing infection. Therefore whatever impairs the musculature of the pelvis or ureter may be considered as a predisposing cause of infection.

Bleeding is always due to an impairment of the continuity of the walls of the blood-vessels, which may be either mechanical (traumatic) or inflammatory (infective).

Evidence of the co-relation of these three phases of kidney disorder are the simple rules upon which the treatment of any one of these conditions individually or of all of them collectively may be based. The principal demands are normal fixation and adequate drainage. When these fail nephrectomy may be necessary but should be contended against as far as possible.

H. G. HAMER.

Young, E. L., Jr.: Clinical Diagnosis of Lithiasis of the Upper Urinary Tract. *J. Am. M. Ass.*, 1917, lxi, 1490.

The absolute diagnosis of stone in the kidney or ureter without the use of the roentgen ray is impossible. A stone may present so-called typical symptoms or present no symptoms whatsoever; again, many patients with symptoms suggestive of renal or ureteral stone and many of them with pathological urines are finally found to have some other renal disease, or disease of some other structure. A good roentgenogram, therefore, is the best evidence of presence or absence of stone, by which method, with good technique, only from one to six per cent are not found.

Stereoscopic plates, with opaque ureteral catheters in place, are necessary to prove the presence of ureteral stone and to distinguish it from extra ureteral shadow-producing structures. The wax-tipped catheter has a very limited value in the case of ureteral stone and an even more limited value in pelvic stone, due to inaccessibility with stone in the lower calyces.

Young reports no success in rendering stones more prominent in roentgenograms by the direct application of collargol or other opaque media through the ureteral catheter.

Among the most common confusing conditions with renal and ureteral lithiasis are seminal vesiculitis and certain orthopedic abnormalities such as

postural strain, flat-foot, scoliosis, hypertrophic vertebral arthritis and sacro iliac strain, but the fact should always be kept in mind that more than one condition may be present.

No single piece of evidence or combination of evidence is sufficient to make an absolute diagnosis of renal or ureteral stone. All chance of mistake should be excluded by using ureteral catheters, wax-tipped catheters, stereoscopic plates and roentgenograms, with injected renal pelvis in selected instances. Repeated careful urinary examination is necessary in all patients with indefinite symptoms, even when a definite orthopedic condition is present.

HARRY CULVER.

O'Neill, R. F.: Clinical Observations from the Study of 371 Cases Presenting Symptoms of Nephrolithiasis. *N. Y. M. J.*, 1917, CVL 876.

O'Neill studied the records of a considerable number of patients of the Massachusetts General Hospital in whom the provisional diagnosis was nephrolithiasis, in order to ascertain, if possible, the proportion of cases in which stone was the cause of the symptoms.

Pyelotomy heads the list of operations on the kidney by a large majority and is the one of election for renal stone, there being less danger from hæmorrhage and infection and less likelihood of recurrence. Occasionally nephrotomy will have to be combined with pyelotomy, due to the size and location of the calculus. Next in frequency of operative procedures is nephrectomy, with nephrotomy as third on the list. Splitting the kidney with a wire and careful suture of the kidney about a rubber tube proved the most effective means of preventing hæmorrhage.

The intravesical operation with the operating cystoscope is of value in a certain limited number of cases of low calculus.

In regard to results, there were five deaths, two of which were due to the anaesthesia. Rapid recurrence was noted in some cases, a persistence of urinary symptoms in others, some abnormality of the urine while symptomatically well in still other cases. The most troublesome cases, according to the author, were those in which a urinary fistula persisted. In these cases a cure can only be obtained by reimplantation of the ureter, and should this fail a nephrectomy should be done. In some cases where there was immediate and persistent leakage following a difficult ureterectomy, constant ureteral drainage has caused a cure. In bilateral cases, the author operated first upon the kidney which by X-ray findings and function was considered to be the better of the two; this is the procedure to be carried out in these cases of bilateral calculous anuria when the condition of the patient will permit one side only to be operated upon.

The diagnosis in all of these cases was made on symptomatology, X-ray and cystoscopic findings, and urine examination. Practically all cases had pain or a history of pain of all degrees and varieties,

which made it impossible to classify. The author says that stones in the ureter give a much more definite picture than those in the kidney. He insists that the relationship of orthopedic conditions to the diagnosis of urinary lesions is one of great interest.

In negative cases repeated examinations of the urine should be made for microscopic blood and albumin; the X-ray is without question the most valuable single method of diagnosis, and with a good technique, proper preparation, multiple exposures and an injected radiograph, few stones will escape; in cystoscopy there is nothing to differentiate calculi from other lesions of the upper tract.

In conclusion, the author states that a persistently normal urine and a persistently negative X-ray in connection with pain in the lower back or abdomen must be a great rarity, if it ever occurs, in cases of lithiasis.

LOUIS GREEN.

Young, H. H., and Colston, J. A. G.: Injuries to the Pancreas Following Operations on the Right Kidney. *J. Urol.*, 1917, I, 170.

Three cases of recognized operative injury to the pancreas are fully reported. Probably many cases of extreme abdominal distension following operations on the right kidney are sequelæ of unrecognized trauma to the pancreas.

Anatomically it would seem that the tail of the pancreas would be more often injured than the head because of its closer contact with the left kidney. This, however, is not the case, because of its greater mobility and lack of firm attachment. Injury to the head also is far more serious as it is larger, relatively more vascular, and the extravasation of pancreatic secretion about the more important structures with which it is surrounded would provoke more serious consequences than a similar occurrence to the tail. An important point to be remembered is that the flexure of the duodenum is retroperitoneal, more or less fixed and attached to the head of the pancreas, so that during traction medianward on it in an effort to expose the right kidney, injury to the pancreas is possible. Adhesions about the upper pole of the kidney, aberrant vessels, and a shortened, infiltrated pedicle are frequent sources of hæmorrhage. Because of retraction into the deeper portion of the wound such a hæmorrhage is hard to control and serious injury to the pancreas and duodenum is easily done in the application of clamps or too vigorous packing, with resultant hæmorrhage and fat necrosis.

Recognition of injury to the pancreas is practically impossible. Progressive and extreme distension, persistent vomiting and abdominal pain, with rapid prostration, are signs of intra-abdominal catastrophe, and laparotomy with relief of obstruction becomes necessary. Drainage of the involved areas in the pancreas is usually all that can be done because of the condition of the patient. Pre-operative preparation insuring thorough evacuation of the intestines, a routine hypodermic of one-quarter of a

grain of morphine and one-fiftieth of a grain of eserine as a preventive against postoperative distension are insisted upon by the authors.

In the first case reported, right nephrectomy for renal calculus was done. During the division of the adhesions about the upper pole a clamp slipped and an active arterial hæmorrhage resulted. Firm pressure with packing and the deep application of clamps controlled the hæmorrhage. The postoperative course was normal for the first twenty-four hours; then restlessness, fast pulse, and abdominal distension came on rapidly. An enterostomy gave fair relief of distension; no obstruction was found. The distension rapidly reappeared with faecal vomiting, and death occurred four days after the first operation. The autopsy showed numerous foci of necrosis in the pancreas, and at the base of the mesentery widespread and destructive fat necrosis, the latter found also in the fat of the ascending colon.

The second case was a pyelotomy for a right renal calculus. Considerable difficulty was encountered due to firm adhesions at the upper pole. These were divided between clamps with no unnecessary hæmorrhage. The following day there was marked distension of the abdomen, and a rapid pulse, poor in quality. Usual measures to move the bowels proved ineffectual; persistent nausea and vomiting was uncontrolled by gastric lavage. An enterostomy was followed by relief of distension on the second day, after which the patient gradually became weaker and presented a general picture of inanition. About a month later, sugar appeared in the urine, with negative findings for acetone and diacetic acid and the patient was put on pancreatin, calcium lactate, and a modified soft diet. Rapid gain in strength followed, and the patient was discharged cured. Here a definite interference with the normal functioning of the pancreas took place without any extensive extravasation of secretion into the tissues about the pancreas, which latter is almost invariably and rapidly fatal.

In the third case, nephrectomy was done for hypernephroma. There was intestinal obstruction requiring enterostomy, due probably to traumatism to both pancreas and the adjacent intestine. Recovery followed.

The foregoing facts emphasize the importance in renal surgery of care in hæmostasis and good exposure, with the avoidance of violent retraction and traumatism.

H. W. PLAGEMEYER.

Thomas, B. A., and Birdsall, J. C.: Comparative Results of Various Functional Kidney Tests, Based on a Series of Cases. *J. Am. M. Ass.*, 1912, LVII, 1742.

In order to obtain more accurate information upon the comparative value of the most popular tests for determination of renal function, the authors subjected each of a group of patients impartially to the following ten functional kidney tests: indigocarmine, phenolsulphonephthalein, total non-pro-

tein nitrogen of blood, urea nitrogen of blood and urine, Doremus' urea test, Ambard's ureosecretory constant of blood and urine, creatinin of blood, and cryoscopy of blood and urine.

A description of the technique employed by the authors in the performance of these tests discloses various modifications from the routine, most important among which are: Quantitative determinations of indigocarmine are made for three-hourly intervals, the Dubosq or a colorimeter recently improved by the authors being utilized, and the greatest reliance is placed on the index of elimination, i.e., the ratio of output for the first and third hours; in the performance of the phthalein test it is deemed more rational, scientific and accurate to regard the quantitative output for the first hour from the time the drug is administered, as against the quantity commonly regarded as eliminated for the first hour, comprising that for the hour after elimination begins, plus the time required for it to appear.

The comparative results of the various tests, which are divided into those of retention and excretion, are tabulated in normal and pathologic cases, upon the analysis of which the authors formulate the following conclusions:

Indigocarmine was found to be more trustworthy and practical than phenolsulphonephthalein. Wherever the performance of more than one test appears to be desirable for confirmatory judgment, phthalein, total non-protein nitrogen, or urea nitrogen may be utilized. Ambard's quotient possesses no actual advantage over indigo or phthalein. Cryoscopy of blood and urine is valueless. Creatinin of the blood and urine, urea nitrogen either per 100 ccm. by the urease or by the Doremus sodium hydrobromide method demonstrate results so variable as to be unreliable.

Finally the authors accentuate the superiority of indigocarmine over all other functional kidney tests, because "it is not only the most practical test, but is unsurpassed in reliability, whether employed for unilateral determination by the method of chromo-ureteroscopy or for total function through reliance chiefly on the index of elimination."

M. KROTOSZYNER.

BLADDER, URETHRA, AND PENIS

Geraghty, J. T.: The Results of Treatment of Bladder Tumors. *J. Am. M. Ass.*, 1917, LVIX, 1336.

Bladder tumors are classified as benign papillomata, malignant papillomata, and papillary carcinomata. Papillomata are a "pedunculated, papillary form of villous tumor springing from the mucous membrane of the bladder, composed of a branching connective tissue framework, lined by epithelium in several or many layers." There is no characteristic appearance in either group. Benign papillomata respond well to the electric current and disappear; malignant types are often stimulated to greater growth. Microscopic examination is not absolute

proof of benignancy, as the portion examined may not have undergone the malignant changes which have taken place in some other portion of the tumor. If the epithelium has broken through its basement membrane and invaded the axis of the papilla on the main stalk, the papilloma has become carcinomatous.

In a series of 65 cases of papilloma, 34 were treated by fulguration alone, the majority with the Oodine current; 20 per cent recurred, only one which proved to be carcinomatous failing to respond to further treatment. Radium radiation has been used for two years in connection with the electric spark in 18 cases with 27 per cent of recurrences. Its value has been demonstrated preparatory to either fulguration or resection when a complete cystectomy or prostatectomy otherwise would have been necessary. Suprapubic removal was carried out in 10 cases. The 6 removed by the actual cautery had 2 recurrences; the 4 by resection, none.

Neither fulguration nor radium alone or in combination were of any value except to give symptomatic relief in a series of 56 cases of papillary carcinoma so extensive as to preclude excision. Excision in 18 cases gave one operative death.

The presence of infiltration in the surrounding bladder wall changing a pedunculated tumor to the sessile type, necrosis, edema, or bullae about the margin, and small nodules beyond the main growth are indicative of carcinoma. Marked induration of the bladder wall felt either through the abdominal wall, rectum or vagina, practically proves malignancy. Histologic evidence of cancer in an excised specimen demands radical measures. The author believes that the information obtained counterbalances the theoretically increased risk of metastasis by excision. A severe intractable cystitis and failure to respond readily to fulguration and radium point unmistakably to cancer. Metastases are usually present in a carcinoma which deeply infiltrates the bladder wall.

The author concludes that early recognition and resection of carcinoma are essential, fulguration and radium having been proved useless. Recurrences after resection respond well to fulguration and radium in the early stages of malignant papilloma. Radium has rendered malignant papilloma more responsive to fulguration in some of the author's cases. The development of endovesical methods has made possible a cure in practically all cases of papillomatosis.

H. W. FLAGGMEYER.

Browne, J. P.: Large Vesical Calculus. *J. Am. M. Ass.*, 1917, lxx, 1586.

Browne removed by suprapubic cystotomy in a girl of sixteen an immense calculus, 4 inches in length and 3 inches around several different circumferences, which had grown around a hairpin as a nucleus. The hairpin was lying in the bladder in a widely extended obtuse angle and was covered with the deposit to within about a quarter of an inch of each end. The patient made an uneventful recovery.

M. KROTOSZYNER.

Young, H. H., and Stone, H. B.: The Operative Treatment of Urethrorrectal Fistula; Presentation of a Method of Radical Cure. *J. Urol.*, 1917, l, 289.

The authors base their discussion on a group of 11 cases of urethrorrectal fistula, in each of which trauma in the nature of a surgical operation was the underlying factor. These operations comprised 1 perineal lithotomy, 4 incisions for drainage of prostatic abscesses, and 6 attempts at perineal prostatectomy.

The various steps of the operation are amply illustrated. The authors describe it as follows:

First, suprapubic drainage of the bladder is established, with the patient in a dorsal posture. The patient is then shifted to the exaggerated lithotomy position. A racquet-shaped incision, beginning in the midline of the perineum about 3 cm. anterior to the anal margin, is carried backward to this margin, and then encircles it at the mucocutaneous juncture. Through the circular part of this incision the mucosa of the rectum is dissected free all around until a cylinder of the membrane is stripped from its attachments well above the point at which the rectal orifice of the fistula opens, the fistulous tract, of course, being divided transversely in this process. This ascending dissection of the bowel is carried upward until sufficient mucous membrane is loosened to permit the pulling of the segment containing the fistulous orifice well out of the anus, the orifice and a small margin of normal mucosa above it and all that below it lying outside the skin level and later being excised. This part of the procedure may be described as an exaggeration of the Whitehead principle in operating for hemorrhoids.

A minor point of some practical importance consists in beginning the dissection of the mucosa at the posterior or dorsal part of the circle. Not only is it easier to find normal planes of cleavage here, where there is no scarring, but the field is less obscured by hemorrhage than would be the case if the anterior side is first attacked, as blood then runs down over the posterior half of the anus.

Next, the structures of the perineal body are divided through the straight incision in the midline, the handle of the racquet, so as to expose thoroughly the urethral orifice of the fistula. It should be noted here that in the first three of the cases the sphincter ani muscle had been cut in the midline anteriorly in previous attempts at cure of the condition, so that this part of the incision actually divided nothing but scar tissue in these cases. This scar tissue in such cases is dissected away laterally sufficiently to expose the ends of the sphincter ani muscle, the levatores ani, and the lesser muscles of the perineal floor. In the rest of the cases with one exception, the intact sphincter ani muscle was divided in the midline anteriorly to allow a better exposure and repair of the urethral opening, and the muscle then repaired as in the first three cases. In one case it was not considered necessary to cut the sphincter at all.

The edges of the urethral fistulous opening then exposed are freshened, and brought together with catgut sutures over a sound which has been previously passed through the urethra. These sutures do not penetrate the surface of the urethral mucous membrane. The levatores, fascia, and smaller muscles are then brought together by interrupted catgut sutures across the midline of the perineum in several layers, reconstructing the perineal body much as is done in gynecological operations for relaxed vaginal outlet. Finally, the sphincter ani is restored by uniting its ends with a mattress suture of catgut, and the midline incision is closed with interrupted sutures. The last stage in the operation consists in the excision of the protruding cuff of rectal mucosa in which the fistulous opening lies, and the union of the lower end of the rectal tube to the anal skin margin. This is done by interrupted silk sutures after four submucous-subcutaneous sutures of catgut have been placed at quadrant points to help anchor the bowel in place.

It will be seen that there are four essential principles in this procedure. The first is the protection of the repair from leakage and muscle-spasm by diverting the urine from the urethra through the suprapubic drainage. This has been emphasized in the publication of a previous operation for the same purpose by Young. The second principle is the complete ablation of the damaged portion of rectal wall and the reposition of perfectly sound mucosa quite to the skin edge. The third element in the operation is the closure of the urethral orifice, and the final essential is the interposition between rectum and urethra of a solidly built-up perineal body.

J. D. BARNEY.

GENITAL ORGANS

Lowmley, O. S.: The Embryology of the Prostate and Its Relation to the Surgery of Obstructive Conditions. *Am. J. Surg.*, 1917, xxxi, 276.

The embryology and morphology of the prostate is detailed by the author, before discussing the surgical procedures in attacking pathological conditions.

The principal conclusions are as follows:

1. An understanding of the embryology and morphology of the prostate is essential for its proper surgical treatment by any method. In Young's perineal operation it is essential to make the incision entirely through the posterior lobe into the lateral lobe cavities before beginning the enucleation; otherwise the instrument will be led into the capsule of the gland and proper reparation cannot be accomplished. The intra-urethral suprapubic type of operation is preferable to the method advocated by Freyer on account of the fact that by the former there is less derangement of the anatomical structure.

2. The posterior lobe of the prostate is never removed either by Young's perineal method or by the suprapubic route.

3. The ejaculatory ducts in practically every instance are not removed in a prostatectomy because of the fact that they are firmly attached to the lamella of connective tissue which separates the posterior lobe from the rest of the prostate. In the suprapubic operation the upper portion of the verumontanum is usually torn away down to the point of entrance of the ejaculatory ducts, but on account of their structural qualities the orifices themselves are usually uninjured.

4. The comparatively late and high involvement of the rectum in carcinoma of the prostate is due to the presence of the fascia of Denonvillier and the intravesicular fascia.

5. The subcervical group enlargements are of frequent occurrence and of great importance on account of the position which they occupy. Excision is best done by Young's punch or a suprapubic cystotomy, although the high frequency current and Chetwood's galvanocautery method are advocated by some adherents.

H. G. HAMER.

Young, H. H.: Carcinoma of the Prostate; an Improved Technique for Radical Excision with Preservation of Urinary Control. *J. Am. M. Ass.*, 1917, lxi, 1591.

From a large number of collected cases of prostatectomy, it is found that from 15 to 25 per cent of the specimens removed show definite microscopic carcinomatous tissue. In 1905 Young presented the technique for the radical removal of the prostate in clinically diagnosed carcinoma. By this technique, it is demonstrated that such carcinomata are radically cured, but most of the patients thus cured suffer from incontinence of urine thereafter. For three years Young has been improving on his old technique, so that now he removes these tumors with a radical cure and no resultant incontinence.

Just in front of the anterolateral prostatic fascia lies that great plexus of blood-vessels, the plexus of Santorini, and the important nerves of the perineum, the external vesical sphincter and triangular ligament. The modification of technique consists essentially in protecting this anterolateral prostatic fascia while freeing the lateral and anterior aspects of the prostate, thus obviating dangerous hæmorrhage as well as keeping intact the innervation and vascularity of the perineal muscles, the external vesical sphincter and triangular ligament.

The entire prostate, with its capsule, and the prostatic urethra, a portion of the membranous urethra, a cuff of the bladder including most of the trigone, both seminal vesicles and from six to seven cm. of each vas deferens with the intervening and surrounding tissues are removed *en masse*. The anastomosis is made between the bladder and remaining portion of the membranous urethra.

The wounds heal with no resulting fistulæ, while the patients have a good bladder control and practically normal urination. Excellent drawings accompany the description.

HARRY CULVER.

Castano, A.: **Hæmatic Cyst of the Prostate** (Kyste hémattique de la prostate). *J. d'uról. méd. et chir.*, Par., 1917, vii, 65.

Castano reports a case of retention of urine in a patient aged 67 years who was a diabetic with prostatic hypertrophy. Examination disclosed the existence of a tumor as large as an orange which completely blocked the rectum. It was smooth and soft but not capable of depression. A diagnosis of advanced prostatic hypertrophy was made. The case was treated for fifteen days, and owing to persistence of urinary and fecal disturbance the patient was then operated upon.

On opening the bladder a large round tumor was found to occupy two-thirds of the organ. After several attempts the author was able to decorticate the tumor at its lower part, but the tumor broke and filled the bladder and wound with blackish blood. At the same time the tumor disappeared. After drying the wound the author could see the prostate; its edges were somewhat hard, and in the midst was a well-marked depression recently occupied by the fluid. The operation was terminated and the patient made an uneventful recovery.

The author believes that the etiology of this process was undoubtedly an intraprostatic hemorrhage due to diabetes.

W. A. BRENNAN.

Shropshire, C. W., and Watterston, C.: **Suprapubic Prostatectomy with Mechanical Drainage**. *N. Y. M. J.*, 1917, cxi, 925.

The authors discuss drainage in suprapubic prostatectomy with the use of Kells' drainage machine, giving the history and results in one of their cases.

The authors state that without mechanical drainage, where they depend on pressure to produce siphonage, it is almost impossible to prevent leakage, with the inevitable result of infection and necrosis of tissue, but with mechanical drainage the bladder is kept dry all the time. The success of any bladder drainage lies as much in the form of drainage tip to be used in the bladder as in the apparatus producing the suction, and to be of value the suction tip must be so arranged that sufficient vacuum is produced to remove urine, mucus, and blood clots from the bladder, but not strong enough to produce enough vacuum within the bladder to cause hemorrhage or pain. Another objectionable feature that should be overcome is odor.

The Kells constant drainage machine is supplied with various sizes of drainage tips and is the ap-

paratus that has proved of greatest value in their hands.

In conclusion, the authors say that

1. Mechanical drainage is of the greatest value in suprapubic operations.

2. It must be noiseless and reliable in its workings.

3. The ideal machine is one in which the working is governed by vacuum and in which a certain fixed amount of vacuum is maintained. LOUIS GROSS.

MISCELLANEOUS

Jacobson, V. C.: **A Case of Multiple Myelomata with Chronic Nephritis Showing Bence-Jones Protein in Urine and Blood Serum**. *J. Urol.*, 1917, i, 167.

The author reports a case of multiple myelomata with associated evidence of advanced nephritis and retention of a large measurable amount of Bence-Jones protein in the circulatory blood. This is probably the first case reported with definite clinical evidence of retention with an advanced nephritis. The elimination of phenolsulphonaphthalein was zero in two hours. The 24-hour specimen of urine showed 0.7 per cent Bence-Jones protein. The Wassermann test of the blood was negative.

By a complete series of qualitative tests the urinary and blood residue was determined to be the same substance. For the quantitative determination of the Bence-Jones protein in the blood a modification of the Folin-Denis method for estimation of the urinary protein was used. By this method the blood serum obtained from the heart at autopsy was found to contain 7.86 per cent of the Bence-Jones protein. The urinary protein was 0.7 and 0.8 per cent eight and two days respectively before death by the ordinary Esbach procedure. In these results is seen a case in which the Bence-Jones protein was dammed back in the blood stream when, as a general rule, there seems to be a selective action of the renal epithelium in excreting a large amount of abnormal protein with a holding back in serum-albumin.

The author agrees with Simon's view of the origin of the Bence-Jones protein, in that it is probably derived from the blood through the action of enzymes from the abnormal plasma cells of the bone-marrow. That it is a foreign protein has been proven by Ellinger, Stokvis and Manthes, who injected it into dogs intravenously and per rectum, finding it excreted unchanged afterwards.

H. W. PLAGEMEYER.

SURGERY OF THE EYE AND EAR

EYE

Rush, C. C., and Schaeffer, J. P.: **Supernumerary Orbital Muscles.** *Arch. Ophthalm.*, 1917, xlv, 524.

In dissecting an adult orbit a slender but well-defined supernumerary muscle was found which had a common origin with the levator palpebrae superioris. At a distance of thirty mm. from its origin it spread out into a fan-shaped attachment, the central fibers of which were attached to the upper and lower borders of the trochlea; one lateral expansion was directly continuous with a similar expansion from the levator and a lower was attached to the superior border of the rectus medialis. Traction upon the muscle gave a feeble internal movement of the eyeball.

The authors discuss the embryology of the orbital muscles, review the literature, and state that the probable explanation of their finding is an excessive differentiation of the premuscle mass which normally divides into a definite number of elements.

S. S. HOWE.

Shannon, J. R.: **Aneurism of the Internal Carotid Artery and Its Effect upon the Vision.** *Arch. Ophthalm.*, 1917, xlv, 518.

The case of a woman of fifty-two is reported, who, with an excellent previous history, became blind in the right eye within a short time, and four months later vision in the left eye had decreased to 20:50. There were at no time paralyses or cerebral symptoms of any moment. She was examined by oculists, neurologists and surgeons without a diagnosis being made. A slow-growing, non-malignant tumor at the base of the right frontal lobe was deemed probable, and to save the remaining vision in the left eye a decompression operation was done with negative findings and result. The patient recovered from the operation but died two and a half months later of cerebral hemorrhage.

Autopsy showed aneurism of the right internal carotid artery near the circle of Willis.

The author discusses the studies and reports of Beadles, Weir, Mitchell and Bramwell, and concludes with the statement that the condition is entirely unsuspected before the fatal apoplexy in almost every case.

S. S. HOWE.

Bonnefon, G., and Fromaget, H.: **Researches on the Histological Evolution of Aseptic Scleral Resections** (*Recherches sur l'évolution histologique des résections sclérales aseptiques*). *Ann. d'ocul.*, 1917, cliv, 305.

The author has made experimental sclerotic operations on rabbits and has made microscopical examinations of the cicatricial tissue after operative

section. The conclusions drawn from this experimental research are:

1. Scleral tissue follows the general laws of cicatrization.

2. The corneal region losses of substance are rapidly obliterated. The fibrinous clot of the first stage gives place after the third day to an organization. The agent is the fibroblast cell, the origin of which is obscure. After two months the continuity of the ocular shell is re-established by tissue more dense and less regular than normal sclera. Inclusion of foreign tissue can alone stop this proliferation. When these obturator tissues are impermeable the ocular tension is not modified. When the tissues are permeable hypotonia by filtration is produced.

3. In any case the wound does not remain gaping; there is never a scleral fistula. Recent histological examination of sclerectomized eyes fully confirms the experimental results. In even aged glaucomatous patients the sclerótica proliferates very rapidly and fills the orifice unless some heterogeneous tissue is interposed to prevent proliferation of the scleral stumps.

4. Simple regular sclerectomy experimentally has only a temporary hypotonic action, since it rapidly results in a scleral impermeable cicatrix. It favors the enclosure of the iris and this complication is without doubt at the origin of acute post-operative glaucoma.

W. A. BRENNAN.

EAR

Rozier, I.: **Wounds of the External Auditory Canal** (*Blessures du conduit auditif externe*). *Rev. de laryngol.*, Par., 1917, xxxviii, 361.

Rozier states that wounds of the auditory apparatus are very frequent in war. In the otorhinolaryngologic war section to which he was attached, of 13,000 patients that were treated since the beginning of the war, nearly 9,000 had ear troubles. Such injuries are due not alone to direct projectiles but also to the effects of explosions. The author treats especially of stenosis and consecutive atresia of the canal. The operative treatment depends on whether the stenosis or atresia is simple and without any neighboring lesion, or whether it is complicated with lesions of the middle ear, old or recent otorrhea, or a traumatic mastoiditis. In the first case the author makes a simple autoplasty of the membranous canal; in the second a petromastoidean opening up is done, followed by the usual plastic procedure.

Rozier gives the histories of eight typical war cases. From their study he finds that in wounds involving the auditory canal a cicatricial tissue is

produced so that the canal becomes stenosed or atrophic either about the meatus, the cartilaginous or bony conduit or even along the whole canal. Such a stenosis may be either circular or tubular.

If after as wide excision as possible of the cicatricial tissue there is still a tendency to re-formation of the stenosis, it will be necessary to: (1) enlarge the external auditory canal by abrading its posterior wall as far as the tympanic membrane; (2) make an autoplasty of the membranous conduit according to Moore's method in order to obtain as large a meatus as possible; (3) attach great importance to postoperative dressings. By following such procedure the author has obtained definite recovery in the majority of cases of stenosis.

W. A. BRENNAN

Shuter, R. E.: Notes on War Injuries of the Ear. *Med. J. Austral.*, 1917, II, 267.

The most interesting feature of this report is the author's theory concerning concussion deafness, the cause of which he suspects lies largely, if not wholly, in the middle ear.

He attempts to explain the phenomena observed; namely, a pronounced diminution in acuity of hearing by air conduction for high notes, associated with retention of range of hearing; that is, the high notes are heard, but only if strongly produced, on the basis of a disarrangement of the middle ear structures whereby the normal action of the stapedius and tensor tympani muscles in accommodation for sounds of weak energy is interfered with or annulled.

OTTO M. ROTT.

Weill, G. A.: Modifications in the Operative Technique for Acute Mastoiditis (Modifications dans la technique opératoire de la mastoïdite aiguë). *Rev. gén. de clin. et de thérap.*, 1917, xxxi, 565.

The author thinks that the group of facial intersinusoidal cells is the route of approach of infection from the antrum towards the apex. In his own procedure he uses the inverse route in order to reach the antrum. It offers the least resistance and is easy to reach behind the lower wall of the canal. As depth is gained, it abuts on the wall of the antral cell.

In two cases of penetrating wounds of the mastoid apophysis the author found that this route had been followed by the projectile, which in one of the cases was found in the antrum itself.

In operating he uses an 8 mm. gouge behind and at the level of the lower wall of the canal to uncover the cortex; then hollows out until a group of cells is met which are curetted. Thence the biting forceps is used to resect the posterior wall of the canal and the cortex of the region behind the breach. Turning the cutting part of the edge upward, the intersinusoidal facial barrier is resected parallel to the canal, widening out at the expense of the apophysis and bony conduit and being guided by the curette. A final touch of the curette breaks down the inferior wall of the antrum and the biting

forceps finishes the work. The operation is completed by exploration and resection of the apex if necessary and by seeking secondary infected areas.

W. A. BRENNAN.

Burton, F. A.: Epithelioma of the Middle Ear and Mastoid. *Laryngoscope*, 1917, xxvii, 755.

This article is a review of the literature on malignancy of the middle ear and mastoid, with the report of a case of epithelioma of these structures.

The definite cause of cancer has not been ascertained, although much research work has been done in recent years upon this subject. Chronic irritation has been found to be a frequent predisposing factor. Cancer may grow in any one of three ways: First, with cells in solid cords and masses; this is the most characteristic and usual way; second, as an adenoma; or third, as a papilloma.

Malignancy of the middle ear and mastoid is extremely rare, less than fifty cases having been reported in the literature. Epithelioma is more common in older, and sarcoma in younger individuals.

Malignancy may follow long-continued ear supuration. Schwartze, however, is quoted as saying that it usually attacks a perfectly healthy ear. Politzer says that the most frequent site of origin of epithelioma of the ear is the auricle and external meatus. Bezold in observing 20,000 ear cases found carcinoma but four times. It is probable that the infrequency of cancer of the ear is due to the freedom of the ear from warts, moles, nevi, etc.

That the diagnosis of epithelioma should be made only after a careful consideration of the clinical course as well as the findings of the microscope is a point well made.

The case reported is a female, aged 43 years, from whose right ear there had been a discharge for five years and impaired hearing for six weeks. When she came for examination she sought relief from pain and aural discharge. There was pain and tinnitus, but no vertigo and no spontaneous nystagmus. The Weber test lateralized to the involved ear. The pain had been very severe for six or seven months, and the discharge had increased in amount and offensiveness. For about the same time she had noticed slight impairment in the movement of the jaw and face muscles, some difficulty in closing her right eye, and a slight progressive loss of weight. Growths simulating polypoid tissue filled the external auditory meatus which bled excessively upon swabbing.

Microscopic examination of this tissue was made and the pathologist reported it to be an epithelioma. The growth returned in a few days after its removal. Eight weeks of X-ray treatment did no permanent good. She was then sent to the hospital and the usual mastoid incision was made and the growth removed. The amount of cancer fluid was excessive and the odor very offensive. In the course of the disease three abscesses developed in the neck, two of which were opened externally and one in the

mouth. There was complete facial paralysis, paralysis of the right vocal band, and great difficulty in swallowing. Hearing was not lost, and at no time were the glands of the neck much enlarged or tender. The patient grew rapidly worse after surgical interference and died; this has been the usual course followed by most of the cases that have been reported in the literature. An autopsy was made and the tissues re-examined, confirming the antemortem diagnosis.

In such cases cures can only be accomplished by an early diagnosis followed by an early extirpation of the cancerous growth.

JAMES J. KING.

Hovell, M.: Gastro-Intestinal Sepsis, a Cause of Ménière's Symptoms. *Med. Press & Circ.*, 1917, civ, 408.

In this discussion of Ménière's symptoms, the author confines himself to those attacks of dizziness and tinnitus which occur in patients suffering from middle ear disease, and which appear without apparent reason, in contradistinction to the same symptoms produced by true Ménière's disease, hæmorrhage in the labyrinth, as well as those due to syringing the ear; to rotation of the patient; to an extension of suppuration to the labyrinth; to an acute disease from inflammation or infective processes extending to it; to vasomotor disturbances which accompany the menopause; or to obvious causes.

The manner in which gastro-intestinal sepsis produces these symptoms is by the associated congestion of the pharynx and nasopharyngeal catarrh, with consequent closure and catarrh of the eustachian tubes.

Treatment is directed to the gastro-intestinal tract as well as local measures to the nasopharynx and the eustachian tube. In addition to inflation, the author injects into the tubes through the catheter a few drops of colloidal argentum, or colloidal iodine, in the form of a spray. The same medicine is sprayed into the nasopharyngeal mucosa.

The author states that this method has been most successful in relieving tinnitus due to any cause, even where deafness remains.

OTTO M. ROTT.

Jones, J. L.: Postgrippal Otitis Media. *J. Ark. M. Soc.*, 1917, xiv, 101.

The gravity of the complications of grippe is emphasized by the author. There is always uncertainty regarding just the condition in which the disease will leave his patient.

The ear complication of grippe is especially dangerous and demands early attention, such as incision of the drum membrane at the first sign of redness, pain, or bulging. After the incision is made, the treatment consists in maintaining continuous drainage and keeping the canal clean by means of irrigations with a saturated boric acid solution.

JAMES J. KING.

Caliceti, P., and Vaglio, R.: The Enterococcus as the Cause of Endocranial Complications of Otitic Origin (*L'enterococco causa di gravissime complicanze endocraniche d'origine otitica*). *Policlin.*, Roma, 1917, xxiv, sez. chir., 450.

It is known that the enterococcus described by Thiercelin may give rise to acute purulent infections, but it has not been recognized that this agent could provoke tympanic suppurations and be the cause of grave endocranial complications of the otitic region. The authors give the details of three cases of this kind observed in soldiers, in all of which they isolated an organism which by its cultural and other characters is in every way identical with Thiercelin's enterococcus.

From the study of these cases and the findings of other investigators they conclude:

1. In some cases of purulent meningitis and thrombophlebitis of otitic origin a germ identical with the enterococcus can be found.

2. The endocranial complications due to the enterococcus which were constantly observed in the authors' cases ran a violent course and rapidly resulted in death, from which it may be inferred that the microbes are especially virulent.

3. In many tympanic suppurations, it is probable that the enterococcus cannot be excluded. In such cases there is a tendency for complications to occur which are often grave and fatal.

W. A. BRENNAN.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Patterson, N.: Operations on the Nasal Sinuses Carried Out Through a Temporary Opening in the Septum. *Brit. M. J.*, 1917, ii, 511.

The author has employed several methods of operating through the septum.

The first and simplest plan is by an oblique incision through the whole thickness of the septum, beginning above, one-half inch behind the nasal orifice and extending down and back to the length of about three-quarters of an inch. If one ethmoid only is to be operated upon, the incision through the septum is made slanting so that the opening through the septal mucosa on the side to be operated upon occurs slightly posterior to that on the other side. If both ethmoids are to be operated upon, the septal incisions are made at right angles to the cartilage. The objection to this simple method is the resistance offered by the septal cartilage.

The second method described consists in making a swing door by two incisions through the whole thickness of the septum extending backward from either end of the primary incision.

The third procedure described and the one preferred by the author consists in performing a preliminary submucous resection ten days or more before the ethmoid operation. At the time of performing the preliminary submucous operation, polypi if present are removed as well as the middle turbinates.

This trans-septal method of attacking the ethmoids has the advantage of bringing the operative area under more direct inspection than when operating through the corresponding nostril. Whether, however, the advantages are sufficiently great to recommend it remains to be decided by future reports.

OTTO M. ROTT.

Stauffer, N. P.: Transplantation of the Tibia for Nasal Deformity. *Penn. M. J.*, 1917, xxi, 26.

The author prefers transplantation of the tibia to that of the rib, because in the latter procedure there is danger of producing pleurisy, pneumonia, and even of causing death.

A curvilinear incision is made between the eyebrows, with the convexity downward. The periosteum is then cut higher up than the skin incision and loosened above, then turned back from the nose on the bridge below. The skin is dissected over the nose by means of Freer's septal dissectors and a piece of tibial bone is inserted under the skin to the tip of the nose and the upper end inserted under the upper portion of the periosteum of the forehead, to which the periosteum of the transplant is

sutured. The skin is closed with fine horsehair stitches and a gauze padding placed over the nose.

OTTO M. ROTT.

THROAT

Roy, D.: Epithelioma of the Posterior Pharyngeal Wall Cured with the Electrocautery. *Med. Times*, 1917, xlv, 313.

The author reports briefly a very interesting case of epithelioma of the pharynx cured by one application of the electrocautery. The patient was a woman 27 years old, with a negative previous and family history. She had suffered for three months with a soreness and throbbing in her throat. Continuous treatment was without result.

Examination showed a rounded ulcer on the posterior pharyngeal wall at the center, one-half of which was hidden by the soft palate; it was a dirty gray in appearance, with sharply defined edges, about half an inch in diameter, and extended as deep as the superficial aponeurosis. A piece excised proved it to be an epithelioma.

The treatment consisted in its removal with the electrocautery point well outside the edges. No reaction and no discomfort followed its removal. The area healed perfectly after one application. Three years have elapsed since the removal of the epithelioma and there has been no recurrence.

JAMES J. KING.

Mortimer, J. D.: The Probable Causes of Fatalities at the Tonsil-Adenoid Operation. *Practitioner*, Lond., 1917, xcix, 482.

The fatalities may be due to:

1. Faulty administration of the anæsthetic because of: (a) failure to select the appropriate anæsthetic; (b) lack of knowledge, so that a deep anæsthesia is mistaken for a light one; (c) failure to maintain a free air passage and to watch the respiration and circulation; (d) failure to regulate or change the anæsthetic when circumstances alter; (e) overdosing, absolutely or relatively. Of these causes, (a) and (c) are more common than (e).

2. Respiratory obstruction, due to the location of the operative field just above the air passage.

3. Shock.

4. Hemorrhage.

Status lymphaticus is considered as more of an idiosyncrasy; the author thinks many reported cases could have been otherwise explained.

As to treatment, the head should be lowered, the face sponged with cold water, the air passage cleared, either by swabbing, maintaining firm intermittent pressure on the back of the chest, by

artificial respiration, or even tracheotomy. Finger pressure over the trachea and larynx through the skin is also suggested as a feasible means of expressing blood clots. Massage of the heart may be useful.

OTTO M. ROTT.

Campbell, R. A.: Tonsillectomy; Some Indications for and Some Observations on the Operation. *J. Lamed.*, 1917, xxxvii, 634.

The generally accepted indications for tonsillectomy are mentioned. With regard to the position of the patient, the author prefers the side position for the following reasons:

1. The tongue can be depressed on that side.
2. The thighs and legs are flexed as in the sitting posture.
3. The trunk and head are in the same relative position as while sitting.
4. The head is tipped backward, the side of the head resting on a sand-bag and the operator sitting with his head on a level with the patient.
5. This position when properly used affords relaxation to the throat muscles so that when the tonsil is grasped, it can be moved in any direction.

OTTO M. ROTT.

MOUTH

Graves, S.: A Case of Adamantinoma Showing Epithelial Pearls. *Am. J. M. Sc.*, 1917, xlv, 313

The majority of neoplasms arising from embryonic structures of the teeth are odontomata. Mallory recognizes three types:

1. The follicular cyst.
2. The adamantinoma, branching masses of epithelial cells of which some correspond to adamantoblasts and others form the enamel pulp. Those cells in the enamel pulp rarely form definite epithelial pearls. The adamantinomata do not produce metastases but often cause much local disturbance.
3. The odontoma, produced by the conversion of fibroblasts into odontoblasts.

Adamantinoma develops from epiblastic cells which normally produce adult enamel, while odontoma arises from mesoblastic odontoblasts which normally differentiate into dental pulp, dentine and cement.

Between the outer and inner layers of enamel cells is the enamel pulp consisting of epithelial

cells whose protoplasmic reticulum sometimes accumulates excessive secretion with abnormal coalescence of spaces, giving rise to cystic tumors filled with gelatinous material. Larger cysts are formed in the stroma of such tumors surrounded with cylindrical cells. "These two kinds of cysts are characteristic of the cystic adamantoblastoma."

In the microscopic picture of the adamantoblastoma the cysts are in the stroma lined with cylindrical epithelium whose nuclei are in the opposite ends from the cyst.

The author reports the case of a negro boy sixteen years old. A growth began as a swelling of the gum one year before he entered the hospital; its development was gradual and painless. The tumor was removed from the superior maxilla and sent to the laboratory with the clinical diagnosis of osteosarcoma.

The microscopic diagnosis was adamantinoma developing from adamantoblasts showing epithelial pearls. Five months after operation there was no sign of recurrence.

F. P. HAMMOND.

Amorosi, P.: A Case of Primary Tubercular Ulcer of the Tongue. *Un caso di ulcera tubercolare primitiva della lingua*. *Riforma med.*, 1917, xxxiii, 798.

From the clinical and anatomicopathologic point of view lingual tuberculosis may assume one of three distinct forms: a tubercular ulcer, a tuberculoma, or a cold abscess. Of the three forms the tubercular ulcer is the most frequent. The author relates a case in a man of 35 years with a tuberculous family history. The ulcer was on the left margin of the tongue. The author excised the left antero-lateral portion of the tongue containing the ulcer. The patient made an uneventful recovery and left the hospital in perfect condition. Pathological examination of the ulcer showed that it was lingual tuberculosis with a positive finding of Koch's bacillus.

The author thinks that the infrequency of tubercular lesions in the tongue is due to two factors: (1) the particular resistance of the lingual mucosa to the direct penetration of the tubercular bacillus; and (2) the natural resistance which all striated muscles offer to bacillary localization. Most writers find a concomitance of tubercular lesions in the respiratory apparatus. This was not found in the present case.

W. A. BRENNAN.

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SURGERY OF THE NOSE, THROAT, AND MOUTH

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INTERNATIONAL ABSTRACT OF SURGERY

APRIL, 1918

COLLECTIVE REVIEW

THE ROENTGEN DIAGNOSIS OF LESIONS OF THE THORAX

By ADOLPH HARTUNG, M.D., CHICAGO

ALTHOUGH the roentgen ray has been used in the diagnosis of thoracic lesions almost since its discovery, it was not until improvement in technique made possible short exposures in the making of roentgenograms that much progress was made. The early work relied almost entirely upon the fluoroscopic examination, and Crane (15) was one of the first to publish a comprehensive article on the value of this method in this country. In 1899 Rieder and Rosenthal (57) reported the making of chest plates in one second or less with the aid of intensifying screens. Three years later Hulst exhibited plates at the annual meeting of the American Roentgen Ray Society made with like speed, with and without the use of intensifying screens. Not long afterward, stereoscopic exposures were produced which marked a distinct advance in the usefulness of the rays in pulmonary disease. Since then most of the progress made has been in the field of interpretation, which even now is far from perfect or exact, and furnishes the main hope for future development.

In this review special stress will be laid on lesions of particular interest to the surgeon. Consideration will be given to foreign bodies introduced by external violence and aspiration, lesions of the wall structures, lungs and pleura, mediastinal contents and diaphragm.

The present war has brought forth a voluminous literature on the localization of foreign bodies, much of which is applicable to the chest, for here it is obviously impracticable to use the simple two-way right angle method of localization. The

stereoscopic method, though valuable, has a limited field of usefulness, because of the time, work and expense incurred to make it available. The requisites (22) of a practical method are:

1. The apparatus needed must be simple, have few parts and these not likely to be mislaid.
2. Their operation should not involve reading fine scales, making numerical computations or drawing diagrams requiring fine measurement.
3. The measurement of small lengths should not be required.
4. The required manipulation of the patient should be minimum.
5. The delay incident to the development of a photographic plate or film must be avoided, except where need of a permanent record is imperative.
6. A minimum number of steps in the process is essential both for speed and to avoid undue fatigue of the operator.
7. Methods should, when desired, be capable of use at the operating table.

Most of the methods in use are modifications of the triangulation method described by McKenzie Davidson (16) consisting essentially of the taking of two roentgenograms with a known distance of tube from plate, shifting the tube a known distance and then reconstructing the lines of the X-ray by a special apparatus or determining distances by mathematical computations. Thus Holland (34) uses a table of distances, Oram (51) a diagram, Blaine (10) a Fuerstenau caliper, and Cole (14) special calipers. Hampson's (29) method permits of direct readings on a scale during the fluoro-

scopic examination. Jordan (18), Straw (65) and Young (68) use the parallax fluoroscopic method whereby the depth is ascertained by adjusting an outside body so that it moves at the same rate of speed on the screen as the foreign body in the tissues. Sutton (61), Hammesfahr (28), Barclay (1) and Viloon (4) pass instruments directly to the foreign body under guidance of the fluoroscopic screen.

After the determination of the location, the question of removal depends largely on the judgment of individual surgeons. Moynihan (50) states: "We may say with confidence that a rifle bullet or a small piece of shell casing may be retained for months or years without causing distress and without affecting appreciably the normal function of the lung in which it lies buried. But with large or irregular pieces of shell the case is different." Results thus far have led him to believe "that it is probably a safer as it is certainly a speedier proceeding to submit all patients in whose lungs a large projectile is retained to operation rather than to leave them untreated."

The roentgen ray can give much information relative to foreign bodies which may have been aspirated into the lung. Childs (13) says:

1. An X-ray examination should be made in every case of suspected foreign body in the respiratory tract, and the foreign body, if present, should be accurately located before any effort is made to remove it. After the foreign body has been located, its removal should be attempted by a skilled bronchoscopist as soon as possible.

2. A foreign body in the respiratory tract may be displaced by the deep breathing incident to anesthesia, so if, at the time of operation, the foreign body is not found at the place where it has been previously located, another X-ray examination should show its new position before further exploration is made, or before the operation is attempted, provided the condition of the patient justifies one of these procedures.

3. A foreign body which does not cast a shadow upon the X-ray plate can be accurately located by careful study of the secondary changes in the lung, incident to the presence of the foreign body.

Beck (5) uses the stereoscopic method of localization and states that during the eight years he has used it he has not failed to locate a single body. Grier (27) states that "because of lack of control over the majority of foreign body cases, we have not found stereoscopy to be of much value, but prefer two views made at right angles to each other (anterior and lateral) with the shortest possible exposure. The lateral view is especially valuable, as the inclination of the

foreign body forward or backward often indicates the particular bronchus in which it is located. In cases in which the foreign body cannot be found by the bronchoscopist, roentgenography with the bronchoscope in position may be helpful."

After localization Ingals and Friedberg (37) have found the roentgen ray of value in directing the bronchoscopist to find it under guidance of the fluoroscopic screen. Grier (27) believes that "fluoroscopic bronchoscopy is only indicated in those cases where the foreign body cannot be located by visual bronchoscopy. When the foreign body is located in a bronchus or other structure which is inaccessible to the bronchoscope, a forceps can be projected beyond the end of the bronchoscope and the foreign body grasped and removed under the direction of the fluoroscopist. To do this satisfactorily, we believe the fluoroscopy should be carried on in two planes at right angles to each other."

In connection with foreign bodies about whose location there is doubt as to whether they are in the esophagus or air passages, Grier (26) quotes Jackson to the effect that foreign bodies more or less flat whose plane corresponds to the lateral plane of the body are as a rule in the esophagus. In the larynx and upper trachea flat bodies are almost invariably located with their greater plane sagittally. Foreign bodies of only very slight density in the esophagus may sometimes be discovered by the stopping of a swallowed bismuth-filled capsule.

Regarding the bony structures of the parietes of the thorax, very little of importance has been added within recent years. Fracture and the various bone diseases can of course be demonstrated with comparative ease. Beck (6) lays stress on the value of injecting sinuses with his bismuth paste and making stereoscopic examinations to determine the location of possible lesions of bone which may have been overlooked. Bythell (12) calls attention to the rounded shadow bulging on both sides of the middle line associated with Pott's disease of the dorsal vertebrae and indicating a spinal abscess.

The recognition by the roentgen ray of gas infection of the soft tissues following injury by bullet or shrapnel is one of the developments from the battlefields. Davis (17) states that "in all cases in which the roentgen ray has shown a 'halo-like' shadow about the missile, we have found clinically, at the operating table and in the laboratory, evidence of an infection caused by gas- and pus-forming organisms. When this is discovered while examining a patient to locate a

missile, it is considered an indication for urgent surgical interference." Berry (7) describes two types of gas infection from the roentgenologic standpoint, one in which there are a comparatively small number of discrete bubbles, the other with extensive and diffuse gas infiltration. Savill (58) warns against errors from loss of tissues, ecchymoses, and abscesses around missiles producing similar pictures. To this might possibly be added surgical emphysema resulting from perforation of the lung by a splinter from a fractured rib.

In the diagnosis of pulmonary diseases, acute conditions only exceptionally give sufficient additional information to warrant the roentgen examination. Moore (47) states that "bronchitis gives a fine string-like shadow radiating outward from the hilum without reaching the periphery of the chest and varying in density according to the congestion present." In the bronchopneumonia of adults, according to Manges (44), "the roentgen rays are of little value unless the areas of infiltration are so large and numerous that they have coalesced into large patches. The small scattered foci of the ordinary bronchopneumonia are often too small to produce distinct shadows." Bythell (12) declares "there is no intrinsic peculiarity in the appearance of the mottling (in bronchopneumonia) to distinguish it from that of tuberculosis consolidations." Acute lobar pneumonia casts a distinct shadow described by Stewart (63) as follows: "The shadows cast by a pneumonic process usually commence at the cortex of the lung; in the early stage, being limited to one lobe, the most common is the middle right. The consolidation is generally wedge-shaped in appearance, with the base at the pleural surface and the apex toward the root; it spreads laterally and inward toward the root until finally the entire lobe is involved. There may be an extension into other portions of the lung, but even this extension usually spreads in the same manner as the original lesion.

"Root pneumonia assumes a somewhat different course. The consolidation appears as a dense, fan-shaped shadow spreading toward the periphery, the outer edge being very irregular. It extends from the hilus outward, involving more than one lobe; many cases do not reach the cortex."

Manges (44) states that the focus of infiltration may be localized by the roentgen ray long before there are any physical signs to indicate the process. According to him, "the indications for the use of the X-ray in the early stages, before the diagnosis can be made by the physical signs, exists in patients with unexplained fevers; or it

may arise in the later stages when one suspects complications such as pleural effusion, empyema, interlobar abscess and abscess or gangrene of the lung."

An abscess of the lung can be easily recognized with the aid of the roentgen ray, according to Pirie (56) if it is partly filled with pus and partly with gas. He emphasizes the point that the erect position is necessary for detection and that the horizontal ray must pass through the upper level of the fluid. Pfahler (54) states that "an abscess is recognized primarily by the evidence of a cavity which has been formed. This cavity is usually surrounded by an area of dense tissue, resulting from the associated inflammatory process, and at times we may recognize the level of a fluid which has collected in this abscess." In gangrene of the lung, he believes there is found less definite cavity formation and more extensive consolidation. Manges (44) describes the gangrene shadow as more diffuse and less definitely contoured than abscess. Chronic lung abscess may be the final condition of untreated cases with foreign bodies (Green and Le Wald, 25).

Regarding bronchiectasis, Moore (48) classifies it from the roentgenologic standpoint into three classes: the infiltrative, the cylindrical and the sacculated. "The first type appears as a more or less stringy increase in density along the course of the bronchi, usually localized in the lower pulmonary lobes and radiating outward from the hilus to the periphery of the chest and extending into the costophrenic angle." In the cylindrical type, "there is the characteristic mottled increase in density, extending outward along the course of the bronchi, producing a more or less fan-shaped shadow. The density is usually greatest near the hilus and distributed throughout this density one or more small areas of diminished density may be located." The pseudo-cavitations are practically pathognomonic of the condition. "The third type is characterized by the localization of distinct pseudo-cavitations surrounded by dense fibrous tissue. It may be so dense and the cavitations so filled with secretion that the shadow in the roentgenogram is almost homogeneous and the diagnosis difficult. However, the true condition is usually revealed by emptying the cavities." Pfahler (54) states that inasmuch as the disease is now being attacked surgically, before the surgeon can operate intelligently the exact situation and extent of the disease must be determined. It may consist of a single isolated large cavity or of myriads of small cavities connected with the bronchial tree. It involves the trachea, the lower portion of the lungs and particularly

the inner part of the lower bronchial tree. The cavities are distributed in line with the bronchi and for this examination stereoscopic examination is found especially valuable. Bronchiectasis may be associated with a foreign body, and this constitutes another reason for routine roentgen examination in this condition.

Regarding the diagnosis of tuberculosis with the roentgen ray, much has been written. Bythell (12) says: "In no other branch of roentgenology is it so necessary to combine the X-ray and clinical evidence as in the diagnosis of early hilus tuberculosis in children. The most frequent seat of origin of pulmonary tuberculosis in children is at the root of one or both lungs, and in the author's experience this holds good in practically every case. Ill-defined mottling extending into the lung substance, where normally there should be nothing visible except the fine streaky shadows radiating from the hilus, indicates a hilus peribronchial tuberculosis. The distinguishing features between old and recent foci are the opacity and sharp definition of the former as contrasted with the softer and less opaque mottling caused by active disease." Giffin and Sheldon (23) state that "the X-ray has been the means by which the time of onset, the location, the extension, in a word, the entire course following a primary infection of tuberculosis in children has been studied." Further:

1. That practically every case of pulmonary tuberculosis with tubercle bacilli in the sputum can be diagnosed independently by the roentgenologist.

2. That in almost all of those cases in which a radiologic diagnosis was positive when the sputum was negative, a review of the histories has corroborated the roentgen findings.

3. That there is a considerable number of patients in whom a diagnosis seems entirely impossible by clinical methods, although the roentgenologist reports positive findings. These include so-called early cases, healed cases, and diffuse tuberculosis.

4. It would seem that a careful study of stereoscopic plates of the chest will show evidences of tuberculosis as early as one can at present be positive of its existence by any other method.

5. That a keener sense of perception is developed through the visualization of lesions, and that roentgenology has been a stimulus to physicians in perfecting their skill in physical diagnosis.

6. That the information obtained from the negative report of a skillful roentgenologist may be of very great assistance in general medical and surgical diagnosis.

7. Finally, it should be emphasized that trustworthy conclusions can be drawn only by one who has had a considerable experience in the reading of stereoscopic plates. The roentgenologist, not the radiogram, makes the diagnosis.

Dunham (18) has attempted to correlate the pathology of pulmonary tuberculosis with the roentgen findings. He (19), Bissell (8, 9), Pancoast (53), Hulst (36), and many others have reported in detail the findings of different types and different stages of the disease. Sewall and Childs (50) endeavored to compare the physical signs and roentgen pictures of the chest in early stages of tuberculosis. Dunham and Rockhill (20) used the roentgen ray as a safeguard in conjunction with the application of therapeutic pneumothorax. With its aid they were able "to select cases, to watch the progress of the disease, to determine the extent of the lung collapse, to note the pressure on the heart and mediastinum, to exclude pleural effusion and to safeguard the unfilled side." Hirsch (32) has furnished a similar contribution.

Syphilis of the lung gives fairly definite findings, but these are far from pathognomonic. Bauch (3) describes two cases in which the main changes were diffuse peribronchial infiltration most marked at and around the hilum. Manges (44) states: "Syphilitic tumors usually show massive homogeneous shadows and are most commonly at the base, less frequently at the hilus. It is erroneous, however, to assume, as is usually done, that gummata are always at the base, since they may occasionally occur in the upper lobe."

Actinomyces may involve the lungs by direct extension from an external lesion or be primarily an intrapulmonary condition. Ledoux-Lebard (40) report three cases, stating that the findings in the primary case were those of a pulmonary abscess and signs of sclerosis of pulmonary and bronchial tissue. Echinococcus disease of the lungs shows itself as a definite rounded tumor mass usually sharply outlined by the surrounding normal lung (Albers-Schoenberg, 1; Mollow, 46; and Weber, 67). Wadsack (66) describes a case in which the cyst contents were coughed up, leaving the capsule clearly visible. Pneumococcosis produces a diffuse mottling, usually spread evenly throughout both lungs. Entin (21) summarized his findings in these cases as resembling miliary tuberculosis except that the spots are larger and less sharp. Boardman (11) describes another type characterized by diffuse and uniform thickening of the linear markings and trunks of the bronchial tree.

Tumors of the lung are practically all malign-

nant. They may be primary or secondary. Moore (47) divides primary malignancies into three classes: (a) the infiltrative type which is characterized by a massive infiltration at the hilum and is usually unilateral; (b) the miliary form showing multiple discrete areas of consolidation scattered through both lungs; (c) the mixed types having some of the findings each of the other. He differentiates these tumors from inflammatory lesions by the absence of an area of inflammation around them and lack of cavitation or pseudocavitation in them. Secondary or metastatic malignancies are far more common than primary ones. Moore (49) reaches the following conclusions regarding them:

1. Pulmonary metastatic malignancy is not an uncommon condition and may occur regardless of the seat of primary focus.

2. Pulmonary metastasis bears no relationship to the extent or duration of the primary focus.

3. The clinical picture in a majority of these cases is very definite, neither the subjective nor the objective manifestations being characteristic of the condition.

4. Metastatic pulmonary malignancy is a definite roentgenographic entity, appearing in the roentgenogram as clear-cut circumscribed areas of increased density.

5. In many instances the diagnosis can be established only by the roentgenogram. By routine roentgenographic examination of the thorax many patients suffering from malignancy will be saved from useless and unwarranted surgery.

Pfahler (54) says that "their surgical importance consists in their recognition for the purpose of avoiding extensive operation elsewhere in the body when this complication exists. This is particularly true in sarcoma, and sarcomata of the lung give a very characteristic appearance, in that they consist for the most part of round or spherical tumors, which may be single or multiple, but are generally scattered through the lung tissue. This evidence of involvement of the lung by metastasis from tumors anywhere in the body usually consists in localized consolidation in the lungs, and the consolidations do not occupy by preference the usual sites of tuberculous disease, though in other respects carcinoma sometimes gives an appearance almost identical with that found in tuberculosis." Lilienthal (42) states: "No limb should be amputated for sarcoma, no hypernephromatous kidney should be extirpated without roentgenologic information about the condition of the lungs. If the characteristic circular discs of opacity are present it indicates a state in

which palliation alone is justifiable." Hodgkin's disease, according to Manges (44), also gives sharply defined round shadows in the lungs, and the discovery of their presence may clear up an unexplained fever.

In pleural complications the roentgen ray furnishes most valuable information both as to diagnosis and treatment. A simple pleural thickening usually causes a diffuse increased density through which the normal lung markings are visible. At times it may be sufficiently marked to simulate fluid but lacks the well-defined limits of such accumulations. Regarding the findings with pleural effusions, Stewart (63) writes: "The character of the shadows cast by fluid in the pleural cavity depends entirely on the quantity and the presence or absence of pleuritic adhesions. The most common finding in a simple pleural effusion of moderate amount is a dense shadow occupying the entire chest on the involved side and extending upward from the diaphragmatic line with a cup-shaped, irregular upper surface. The size of this shadow depends, of course, on the quantity of fluid present. In children, however, even without adhesions, we may have a clear area of lung structure between the fluid and the root down to the diaphragm. This is especially so in beginning effusions where the shadow of the fluid seems to extend upward on the parietal pleura, before overshadowing the lung markings at the base. As the pleural cavity fills, and it usually fills rapidly in children, the distinctive cup-shaped upper border gradually disappears until finally the entire side is occupied by a dense cloud of a consistent character which completely overshadows the entire lung. This is usually associated with some displacement of the mediastinal contents to the opposite side, although this result occurs much more frequently in adults than in children.

"If adhesions are present, the effusion may become encapsulated, in which cases the dense shadow cast by the fluid usually appears as a globular mass encroaching upon the lung structure from the cortex toward the root, the base of this shadow conforming to the shape of the chest. This sacculation may occur high up or at the base; or it may be anterior or posterior."

Pfahler (54) believes that empyema generally gives a denser shadow than does an ordinary serous effusion. Exudates associated with pneumonic changes in the lung may be difficult to diagnose on account of the multiplicity of the shadows. Manges (44) states that "interlobar exudates produce 'hanging shadows' which extend along the fissure line from the hilus toward the

lateral thoracic wall." He also calls attention to the fact that change in the fluid level with change in the position of the patient takes place much more slowly than is generally assumed unless air is present in the pleural cavity. Information derived from the roentgen examination in empyema may not only determine the site for operation, but its nature as well. Lilienthal (42) states: "For the last two years I have been developing the operation for empyema of the thorax along the lines of rational surgery. Instead of contenting myself with the old-fashioned and non-progressive routine rib resection with its 20 per cent or more of secondary thoracoplastic operations, I do not, as a rule, resect in general empyema, but make a long intercostal incision, spreading the ribs wide apart, exploring the entire pleural sac and shaping the operation to fit the case. I do this operation either in one stage or, when the patient's condition is too critical, in two stages, the first step being merely a minor intercostal thoracotomy for immediate relief. The major, or second step, some days later, is again preceded by a radiographic examination. But in encysted or sacculated empyema it is possible to avoid entering the free cavity. The problem is a different one, merely the drainage of the pus collection without general exploration. With the aid of X-rays the exact localization of the pus is possible and the intercostal method of operating is contraindicated. Instead, we resect two or more ribs, usually together with the periosteum, and opening the cavity, treat it as an abscess, first packing with gauze, later draining as necessity arises. This selective surgery replacing the blind thoracotomy so generally practiced would be quite impossible without the guidance of the radiogram. Several times I have seen an encapsulated empyema mistaken by an expert diagnostician for a general one. By the use of the X-ray the encapsulation was established and a smaller and less dangerous operation substituted for a greater and more perilous one."

In regard to pleural tumors, Pfahler (54) says: "These may be primary or secondary, but are generally secondary to carcinoma of the breast. This cancerous involvement is usually associated with fluid, and is often difficult to differentiate from fluid due to other causes." Manges (44) states that in nearly every instance they have massive effusions which constitute the only X-ray finding.

Pneumothorax can be readily diagnosed by its increased radiability and absence of any of the characteristic lung markings. If fluid is present at the same time, it moves very freely. Ac-

cording to Manges (44), "small pneumothoraces are not infrequently found on X-ray examination where one has little or no reason to expect them. In the past few years I have observed this eight times. These small localized air shadows are usually found near the mediastinum and were not associated with any displacement of the thoracic viscera."

The same author declares that the development of adhesions and involvement of the diaphragm can only be determined by X-rays. Lange (39) states that "adhesions do form and alter the shape and restrict the movements of the diaphragm and may be optically demonstrated. Pleural adhesions will gravitate into the costophrenic angles and obliterate them." Mace (43) reported a number of cases in which the X-ray revealed an adhesive diaphragmatic pleurisy with symptoms resembling gastric ulcer. The position and shape of the diaphragm may serve as an indication of lesions in the thorax or abdomen. "Some alteration in the phrenic level is a very constant accompaniment of intrathoracic tumors." (Lange, 39). In phrenic paralysis, the diaphragm stands at a high level and rises during inspiration and falls during expiration. Eventration of the diaphragm can be easily shown with the aid of the roentgen ray, especially if the stomach or colon are filled with bismuth (Stein, 62). Likewise diaphragmatic hernia can be thus shown; cases have been reported by Grandy (24) and McCleave (45). Subphrenic abscess may be differentiated from possible thoracic lesions by noting the high position of the diaphragm with a normal lung above it, and if gas be present, there is a clear shadow immediately below the diaphragm (Pfahler, 55).

Regarding bronchial glands, Overend (52) divides them into three groups: (a) tracheobronchial; when these are diseased, a shadow is seen outside and parallel with the sternum, occupying the second, third, and fourth posterior interspaces. For diagnosis, its intimate relation with the trachea and extrapulmonary bronchus is decisive; (b) bifurcation glands; these are practically invisible except in the oblique picture. For a positive diagnosis, the two limbs of the bifurcation must be discernible with the shadows in close connection with one or both; (c) hilum glands; an increased hilum opacity may be irregular in outline and contain deeper shadows within it. If the appearance is one of diffuse cloudiness with faint external margins, merging gradually into the pulmonary fields, activity is present.

Mediastinal tumors, according to Pfahler (54), are important as a surgical complication "be-

cause it is often necessary for the surgeon to decide whether the tumor which he is about to remove from some external organ, such as the breast, the thyroid in connection with goiter, sarcoma of the cervical glands, etc., may also have invaded the mediastinum. In some instances, even a primary tumor may be taken into consideration for surgical removal." The roentgen ray can offer definite information regarding the nature and extent of such tumors. "Sarcoma is generally primary, usually involves the upper portion of the mediastinum and extends outward most commonly in the direction of the section between the upper and inner lobe of the right lung. It is generally irregular in outline, there is no expansile pulsation, and the characteristic extension would serve to make an exact diagnosis. Lipoma may develop to the size of the patient's head, as I have seen in one case, and in which it was almost perfectly symmetrical, and showed no involvement or line of extension to other organs. It lacked the involvement of the septum of the lung, as is commonly true in sarcoma."

Carcinoma is nearly always secondary, and most commonly a complication of carcinoma of the breast, resulting from a direct extension through the lymphatic system. The tumors are usually small, and commonly produce no direct pressure symptoms. Occasionally the whole upper mediastinal space becomes filled with malignant tissue. Hodgkin's disease frequently involves the mediastinal glands, producing tumors of variable size. Associated with glandular enlargement in the neck, this is important in the differential diagnosis with tuberculous glands which rarely involve the mediastinal glands but rather the bronchial glands. Thymic enlargement is recognized by an extension of an abnormal shadow outward, especially to the right, but it may also extend to the left of the manubrium, sometimes half an inch, sometimes an inch or more, so as to make a distinct tumor mass. Generally, however, this thymic enlargement is recognized by only a faint but definitely formed shadow extending from one-half to three-quarters of an inch to the right of the manubrium. Hoxie (35) says: "The fluoroscope should be used to verify all cases where the percussion would indicate thymic enlargement." Thoracic goiter may cast a distinct shadow or encroach upon the tracheal shadow, producing an hour-glass or S-shaped configuration (Hartung, 31). A case of endothelioma, seen by the author, produced an enormous irregular enlargement. Shen (60) has described a fibroma of the mediastinum.

All of the above tumors are non-pulsating,

differing in that respect from aneurism of the aorta. This can be readily diagnosed with the aid of the fluoroscopic screen. The diagnosis of the variety of aneurism is important, for Hare (30) states that wiring with electrolysis for therapeutic purposes is contra-indicated in the fusiform type. Atheroma of the aorta is recognized, according to Pfahler (54) by the evidence of tortuosity and consists especially of a sharp projection to the left at the beginning of the descending portion of the arch; more important is the detection of calcareous plates in its walls by examining the patient in the oblique diameter. The discovery of the above conditions may have an important bearing on the advisability of performing an operation for some other condition.

Relative to heart lesions, Hirsch (33) summarizes the value of the roentgen examination as follows: "In a general way it may be said that this method, by permitting the visualization of the activities of the heart, gives such a definite conception of its shape and its relationship to the thoracic contents as no amount of percussion can give. One of the most important contributions of the roentgen ray in the examination of the heart has been to provide a method for its measurement. This method makes it possible to study with considerable accuracy the response of the diseased heart to therapeutic agencies, to foretell impending decompensation and to determine the particular portion of the heart subjected to the greatest stress. The basis of the diagnosis of cardiac valvular lesions by the roentgen ray is the change in form which follows disordered function resulting from diseased valves." Two main varieties may be described: (a) the mitral type or spherical heart with enlargement of the right below and left above; and (b) the aortic type or oval heart with increase of the left ventricular shadow and of the ascending aorta and arcus aortae, and violent pulsation of the left ventricle. In mitral stenosis and persistent ductus Botalli the heart is rather small and there is an increase of the left auricular shadow.

In pericarditis with effusion the exudative changes cause an increase in the heart shadow in all directions, especially to the right, so that the transverse diameter tends to approach or exceed the longitudinal. The median shadow assumes a rounded broad triangular shape. Bythell (12) states: "In pericarditis and pericardial effusions an important diagnostic point is the loss of the 'cardiohepatic' angle; its absence is a perfectly reliable indication of the presence of pericardial fluid or of great thickening of the pericardium."

Lehman (41) describes the characteristics of pericarditis with adhesions as follows:

1. Band-like filling in of one or both cardio-diaphragmatic angles.

2. Distinct notch formation of the heart shadow contour.

3. Indistinct "fluttering" heart pulsations corresponding to a covering over of the heart shadow by broad adhesions.

4. Lessened motility of the diaphragm due to basal fixation in cases where the lungs are negative.

Coming within the thorax, brief mention will be made of lesions of the esophagus, although little new has been added in the line of roentgen diagnosis within recent years. Diverticula can be readily recognized if they are filled up with an opaque meal or paste. In the same way constrictions, whether malignant or benign, can be shown if the narrowing is sufficiently marked to cause some obstruction to the meal. In order to see the changes before this occurs, Stewart (63) devised a long hollow cylinder of soft material, part of which he had the patient swallow. He then distended this tube with opaque contents and thus mapped out the entire esophagus.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

ASEPTIC AND ANTISEPTIC SURGERY

Gould, A. P.: *Modern Antiseptics. Brit. M. J.*, 1917, ii, 677.

Gould reviews the progress made in antiseptics. The entrance of bacteria into wounds was early recognized as the damaging factor in wound repair, and the prevention of wound contamination was heralded as a great advance in surgery.

The question which confronts the surgeon who comes in contact with a large number of already badly infected wounds is whether antiseptics cannot eradicate these same organisms from the tissues in which they are already growing, and leave the tissues free to heal in the same painless, feverless and rapid way as when no infection has occurred.

It is the infiltrated abscess wall which gives rise to symptoms. When the abscess is opened and the dead material is permitted to escape, the destructive process terminates, and healing begins.

When an acute abscess bursts and healing occurs, the following factors play a part in the process: (a) autogenous germicide; (b) preservation of the living surrounding tissue; (c) evacuation of all dead material and pus.

The author believes that mechanical cleansing and draining of the wound is not sufficient for wound healing. The natural germicidal properties, the author asserts, are slow and inadequate. Boric acid dressings as commonly employed must not be regarded as external, or heterogeneous antiseptic dressings. They may be of value only in stimulating the flow of the natural antiseptics.

Taking the natural method of sterilizing infected wounds as the model, the following principles must be observed: (a) efficient germicidal agents are to be used; (b) antiseptic agents must be innocuous to living tissue. Opposed to natural antiseptics are substances like pure carbolic acid, or substances poisonous when absorbed into the blood stream. (c) The efficient but harmless antiseptic should be applied continuously to the entire infected surface; and shall be so administered as to find its way to every spot in the germ-laden tissues. (d) The rapid removal from the wound of all dead and dying tissue is necessary. This should be accomplished early, and should be neither intermittent nor dependent upon such violent measures as strong irrigation or a firm pressure.

The author puts the treatment of infected wounds into three divisions:

1. The use of an antiseptic which is at once very highly germicidal and innocuous to human tissue; flavine is cited as an example.

2. Frequent gentle application of a potent germicide to the whole surface of the wound until the discharge is clinically sterile, and closure.

3. Immediate closure of the wound with a sufficient amount of reliable germicide.

Brilliant green and flavine are of some value, the author asserts, but are not new to the surgeon. The second method is that introduced by Carrel; the third is the Morison treatment.

In commenting on the Carrel method the author asserts that he has visited the hospital at Compiègne, and observed the method as carried out by Tuffier; the results were striking. He states that he has seen a large number of compound fractures which healed without any formation of pus. A large number of empyemas were treated by free incision and irrigation by the Carrel-Dakin solution with remarkable results. The aim of the Carrel treatment is to obtain clinical sterilization, and then to close the wound and secure union. No wound shall be closed until it has been proved to be practically sterile by three repeated bacteriologic examinations. He emphasizes the importance of carrying out the rules laid down by Carrel, and a personal observation by the surgeon himself of the details.

The Morison method consists in first removing from the surface of the wound as completely as possible all dead and dying tissue and tissue detritus, and all accumulations of discharges and of bacteria as well as blood-clot, and all other foreign matter. The wound is dried and filled with a paste called bipp; the paste is rubbed well into the wound, and then the wound is closed. A dressing is then applied which is to remain for twelve days. At that time the wound is found healed.

The author discusses this form of treatment at length, and considers this by far the most efficient means of wound disinfection. The results that he observed were beyond belief. He did not come personally in contact with the cases treated by Morison, but his impressions were obtained from eye witnesses and from written reports which he read.

He concludes that the methods here advocated require a thorough understanding of the principles upon which they are founded, and must be thoroughly studied and scrupulously carried out by the surgeon, assisted by competent nurses.

M. A. BERNSTEIN.

Dakin, H. D., and Dunham, E. K.: The Relative Germicidal Efficiency of Antiseptics of the Chlorine Group and Acriflavine and Other Dyes. *Brit. M. J.*, 1917, ii, 641.

When the unstable chlorine germicide is added to the medium and permitted to decompose, and then are added the micro-organisms, it will be found that the organisms will grow unchecked. The authors criticize experimenters for not observing these well-known principles, and assert that their failure is due to these errors.

Browning published a series of experiments in which the germicidal potency of various antiseptics of the chlorine group is compared with the various dye stuffs with results indicating a numerical superiority for the latter. This the authors assert to be untrue, and they attribute the results obtained by Browning and his associates to a wrong technique in testing the germicidal potency of the chlorine antiseptics.

The lethal concentration of chlorine-T tested against staphylococci in serum was taken as unity. The lethal concentration of chlorine-T in serum was stated to be 1:150. Much lower concentrations were published by other observers. The discrepancy was due to the fact that the antiseptic was added first to the medium and last to the organisms. No indication was given by Browning of the all-important interval of time elapsing between the two additions.

The hypochlorites and antiseptics of the chlorine group possess properties of instability and reactivity. They react with proteins, peptones and amino-acids to furnish products, some of which still possess germicidal properties, i.e., chloramines, and others which are entirely inert, i.e., chlorides and compounds containing chlorine united to carbon.

When a relatively large excess of protein acts on minimal quantities of hypochloride, no chloramine derivatives persist, and the whole of the chlorine is converted into germicidally inactive forms.

Experiments in which workers have taken protein-rich media, then added minute quantities of the chlorine antiseptics, and after an unstated interval, when all or most of the antiseptics have been decomposed, the mixture was inoculated with organisms, surprise was expressed at the ability to grow organisms. Under such circumstances the observed results depend much more on the rate of reaction between the antiseptic and the protein medium than upon germicidal action. Great difficulties are encountered in securing uniform laboratory experiments on the germicidal action of substances upon pus, largely owing to extreme variations in its composition and physical condition, and whether the infecting organisms are free or ingested in the leucocytes. Serum as a medium has a distinct advantage because of its fairly constant composition, although many organisms are very susceptible to the action of blood serum.

In conclusion, the author sets forth the following: (1) Rapid and complete disinfection was brought

about by solutions of members of the chlorine group of antiseptics of the strength commonly used in the treatment of wounds, when added to heavily infected blood serum-muscle extract mixture. (2) Under similar circumstances solutions of acriflavine, proflavine, brilliant green, and malachite green failed to sterilize in six-hour mixtures which the chlorine antiseptics sterilized completely in five minutes or less. The author further shows that a 1:600 solution of chloramine-T can sterilize in six hours an infected blood serum-muscle extract which was not sterilized in six hours by 1:1,000 acriflavine.

The errors in Browning's experiments were: first, the addition of the chlorine antiseptics to the blood serum before adding the organisms; secondly, the use of weak bacterial concentrations in their tests, namely, 0.1 ccm. of a 1:20,000 dilution in saline of a twenty-four peptone water culture. It appears that the use of such small numbers of organisms is unsuited for the determination of the germicidal value of substances, for, in the first place, such a low concentration of organisms in the secretion of a wound of long standing borders on "surgical sterility" and is therefore not comparable with the concentration in acute septic wounds. If 5 per cent of the organisms in Browning's tests survived they would have a good chance of being entirely overlooked, and sterility might thus be inferred when viable organisms were actually present.

Another cause of the marked difference between the authors' and Browning's results was due to the fact that Browning allowed the antiseptics to act for twenty-four or forty-eight hours before testing, whereas in the authors' experiments subcultures were taken at frequent intervals, which brought under observation the progress of disinfection. The longer period naturally fosters a favorable judgment of the slowly acting dyes, while shorter periods are adverse to them. M. A. BERNSTEIN.

Bouet-Henry: Gutta-Percha Hyperthermic Dressings (Divers pansements hyperthermiques par la gutta-percha). *Bull. Acad. de méd., Par.*, 1917, lxxviii, 627.

The author, a gynecologist, has experimented for the past twenty years in the matter of dressings. He directs attention to the great value of thermotherapy not alone in gynecology but in war wounds. Older methods of applying paraffin, vaseline, etc., at a high temperature were not without danger of burns or pain because they could not be insulated during application. The author employs gutta-percha to supply this insulation. A mixture is made of a low grade paraffin, fusible at from 42° to 45°, with gutta-percha, in the proportion of 50 of gutta-percha to 1,000 paraffin. This can be applied without burning at a temperature of 70° to 90° and is painless and very pliable. It cools ten times more slowly than water applied at the same temperature. It has been successfully used in Pozzi's Gynecological Clinic and in several of the war ambulances.

W. A. BRENNAN.

Gould, A. P., and Others: A Report on the Carrel-Dakin Treatment of Wounds. *J. Roy. Army M. Corps, Lond.*, 1917, *xxix*, 616.

The Commission headed by Gould recently visited Carrel's, Tuffier's, Chutro's, and other hospitals in France to study the Carrel-Dakin method in operation. In Carrel's and Tuffier's clinics the dressings are renewed every day. In Chutro's the inner dressing is changed daily for three days after an operation, and subsequently every second day. The outer dressing is renewed only about once a week. The Commission could not see that Chutro's less costly practice was attended with any disadvantage.

Every dressing was made by the surgeon himself under the strictest aseptic. He was assisted by a large staff of highly trained nurses, each charged with one step only in the preparation of the dressing. This made the technique elaborate and the process rapid. The Commission has since found that it is possible to carry out the dressings with two or at most three trained helpers.

In Carrel's and Tuffier's wards a "smear" is taken every second day. When the chart shows a count of less than one organism per field on three successive occasions, the wound is "clinically sterile" for operative closure. The making of these bacteriologic observations and counts is essential if the surgeon desires to practice secondary closure of infected wounds. In Chutro's clinic the procedure is simpler. In a large number of cases no bacteria charts are kept and smears are only examined once in ten days. Chutro does not secondarily close infected wounds.

The Commission refers to the methods for keeping the patient's bed dry.

The use of Dakin's fluid or eusol sometimes causes irritation around the wound. This must be guarded against. In Carrel's and Tuffier's clinic the skin for some distance beyond the wound is protected by a layer of gauze soaked in sterilized vaseline. Chutro applies vaseline only when he sees evidence of irritation and then he puts it on thickly by means of a sterilized wooden spatula. The Commission thinks that Chutro's plan is the simpler and that it is effective.

In Carrel's, Tuffier's and Chutro's clinics only Dakin's fluid is used. In other hospitals eusol and ether were used as well.

The Commission says that in estimating the value of the Carrel-Dakin treatment, the method of applying the antiseptic and the antiseptic employed must be appraised quite separately. While convinced that the use of the Carrel tubes is a very valuable means of applying an antiseptic, the Commission is not satisfied that Dakin's fluid is markedly superior to eusol, and it is prepared to find that other antiseptics can be used with advantage by the Carrel method.

The results of the Carrel-Dakin treatment as seen by the Commission in a large series of unselected cases were strikingly good:

1. The bacteria chart usually showed a rapid fall in the number of bacteria present in the discharge. Tuffier states that he can sterilize any wound by this treatment.

2. Many wounds rendered clinically sterile were then closed and healed by primary union. In some cases cavities in bone due to comminuted fracture or chronic osteomyelitis and necrosis had been filled with a subcutaneous fat graft and the skin edges sewn over the graft. Primary union occurred and the bone consolidated. Only wounds proved in the laboratory to be practically germ-free should be dealt with in this way. This point is insisted upon.

3. In Tuffier's clinic the treatment is most effective in postpneumonic and chronic empyema resulting from gunshot.

4. The Commission saw a large number of serious gunshot wounds treated by the Carrel-Dakin method in which there was no suppuration. These included compound fractures of the pelvis, femur, tibia and humerus, etc., as well as chronic osteomyelitis of various bones. In cases of badly uniting fractures Chutro does not hesitate to divide the bone to obtain proper alignment of the fragments.

5. The wounds granulated well, the granulations were even and florid; and so far as the Commission could judge, the healing progressed rapidly.

6. The patients looked well and were free from fever when the bacteria count was low. They made no complaints of the method.

7. The most striking evidence of the value of the treatment was a printed notice put up by Tuffier in his clinic as expressing his opinion after a considerable experience with the Carrel-Dakin treatment. This notice reads:

"Every patient who suppurates has the right to ask his surgeon the reason for it."

The objections raised to the treatment are in brief:

1. It requires the personal attention of the surgeon to each individual treatment. The number of cases that can be treated is therefore limited.

2. The technique is more elaborate than that of most wound dressings and causes a heavy strain on the staff.

3. It is alleged that flushing the wound every two hours is disturbing or painful to the patient.

4. There is difficulty in preparing the antiseptic fluids.

The Commission thinks that these objections are one and all of small account when compared with the proved advantages of the Carrel method.

The Commission is of opinion that the Carrel-Dakin method of treatment if carried out thoroughly is full of promise and believes that it will (1) diminish the dangers incidental to sepsis, including secondary hemorrhage, (2) hasten the patient's convalescence, (3) lessen the liability to stiff joints and cicatricial deformities, (4) enable the patients to leave the hospital with better general health than they otherwise might, and (5) where secondary operation becomes necessary, those operations are more likely to be free

from septic complications than where some other system of primary treatment has been adopted.

An appendix to the report gives the full details of the preparation of Dakin's solution, according to Dautresne's technique. In France the cost of this solution works out at about three centimes per liter, so that the cost of treating an average case per twenty-four hours is only about one cent.

W. A. BRENNAN.

Gross, G., and Others: Primary Suture of War Wounds (*Le suture primitive des plaies de guerre*). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1806.

Tissier has demonstrated that every war wound which is not infected by the streptococcus can be primarily sutured after appropriate surgical treatment and ought to heal. The authors have put this into effect. Of 727 wounded delivered to their hospital by the ambulance, 430 have been sutured primarily, 175 were not operated upon; 119 could not be sutured for various surgical reasons, and 3 cases were other than war wounds. Thus of those operated for war wounds, 78.3 per cent were primarily sutured. Of the sutured cases 209 were severe fractures. In the 430 patients 759 sutures were executed and these gave 675 unions by first intention. The stitches were removed by the tenth day and cicatrization was perfect. There were altogether 23 deaths in the cases sutured, but the majority of these deaths were due to abdominal, thoracic or other complications; and the authors say that in reality only 3 sutured wounds resulted fatally out of a total of 759 sutures.

The authors describe the details of their bacteriological examinations and surgical treatment. They think that the advantages of primary suture in war wounds are incontestable. The patients escape the danger of secondary infection which is so frequent when wounds are left open. In fresh wounds staphylococcal infection is found only in from 10 to 15 per cent, while in the territorial hospitals 80 per cent of the wounded show this infecting agent.

Besides these advantages it is beyond doubt that from the economic point of view, the results are of the highest importance; there is economy of time and material and a considerable economy in hospitalization and in pensions. Patients with gross injuries of the soft parts are completely cured about the thirtieth day. The only conditions necessary to realize the excellent results obtainable is to assign a competent bacteriologist to work with competent surgeons, and to allow them to keep patients until cicatrization is complete.

W. A. BRENNAN.

ANÆSTHETICS

Echols, F. S.: Anæsthesia and the Anæsthetist. *Virg. M. Semi-Month.*, 1917, xxii, 375.

It is the object of the author to give to the novice the fundamental principles of anæsthetics and a working technique for the use of ether by the open drop method. He defines surgical anæsthesia

as "a condition of unconsciousness sufficiently complete to allow surgical operations to be performed without pain and with as little shock to the nervous system as possible." He claims that in the administration of all anæsthetics until the patient is in absolute surgical anæsthesia there is more or less shock.

The three stages of anæsthesia are well described, with the symptoms and their proper interpretation noted. The duties of the anæsthetist to the patient and to the operator are clearly set forth in such a manner as to impress upon the anæsthetist that he has no time for close observation of the operative technique itself. He describes a fourth stage of anæsthesia, the stage of too deep anæsthesia, the danger zone. The symptoms, with their proper interpretation and methods to combat this undesirable stage, are clearly given.

Cyanosis itself in the third stage is not necessarily a sign of too deep anæsthesia. The author finds that some people cannot be anæsthetized sufficiently to permit of an operation unless they are cyanosed all the time. The respiration must be carefully watched in these cases and as long as the breathing is regular the patient will have no difficulty. In case of apnoea during the course of an otherwise smooth anæsthesia, the author makes several useful suggestions to force breathing as soon as possible.

The article concludes with several valuable suggestions. Most important of all is the warning to the anæsthetist not to "get excited"; an excitable person is much more dangerous than is an absolute novice who follows the prescribed rules and keeps his head.

ELLIS FISCHER.

Thompson, J. E.: An Anatomical and Experimental Study of Sacral Anæsthesia. *Ann. Surg.*, Phila., 1917, lxi, 718.

Sacral anæsthesia is used as a routine procedure in the surgical clinic of the John Sealy Hospital in all operations on the anal canal and lower rectum, in perineal operations, in external urethrotomies, and in operations on the body of the penis, also when combined with local infiltration of the abdominal wall in cystotomies and suprapubic prostatectomies.

The solution is made by dissolving three No. A tablets in 30 ccm. of distilled water and adding 10 drops of 50 per cent solution of calcium chloride. The composition of the A tablets is novocaine 0.125 gm., and suprarenin 0.000125 gm; 30 ccm. is injected into the sacral canal. As a rule one injection is sufficient and anæsthesia is complete in half an hour in the branches supplied by the sacral nerves.

The region of the anus loses its sensibility first. Even though anæsthesia may be complete to the knife or cautery, the patient may resent rough dilatation of the sphincter. It has been found that the greatest intensity of action is shown in the areas supplied by the sacral nerves from the second downward, but that it extends in many cases upward as high as the upper lumbar and lower dorsal nerves.

Sometimes the anæsthesia is deep enough to allow performance of operations on the scrotum, the inguinal region, the dorsum of the penis, and the suprapubic region of the abdomen. The clitoris and labia minora do not often lose their sensibility completely.

The author presents charts to show in graphic manner the area of anæsthesia, the time taken for the anæsthetic to produce its effect, and the spinal segments affected.

The injecting needle seldom passes higher than the third sacral vertebra. The author conducted a series of experiments upon 13 cadavers in which staining fluid was used instead of the anæsthetic solution, and it was found that the fluid diffuses upward to levels varying from the third thoracic vertebra in eight bodies to the seventh cervical in one body. In none of the bodies did any of the injection fluid get inside the dura mater. In every case there was deep staining of both the anterior and the posterior branches of the sacral nerves.

In giving the anæsthetic, the needle enters the hiatus sacralis, which can be felt easily in a thin subject, but in obese subjects, where the bony landmarks are obscure, the needle can be introduced about an inch above the end of the sacrum. The direction of the needle should be upward, directly in the middle line. Some resistance will be felt as the needle penetrates the fibrous membrane closing the hiatus, and it is not necessary to insert the needle any farther than 3 to 4 cm. If cerebrospinal fluid flows, the needle should be withdrawn to a lower level until the fluid ceases to flow.

For purposes of making a more complete study, 33 sacra in the dissecting room were examined and the author presents a table of the anatomical features. In 24 of the 33 specimens the probe passed along the whole canal. In the remaining 9 it passed, in all except one, as high or higher than the second sacral foramen. In this specimen it passed as high as the upper part of the fourth sacral foramen. In only one case was the canal so narrow as to raise

doubts whether a needle could be passed along it. In every case the sacral canal was accessible to the needle. There seems no reason to doubt that if the needle penetrates the fibrous membrane that closes the hiatus and enters the loose cellular space, the injected fluid will pass upward around the nerves and around the dura mater.

V. C. HUNT.

SURGICAL INSTRUMENTS AND APPARATUS

Marshall, H. W.: *An Orthopedic Innersole for Shoes*. *Am. J. Orthop. Surg.*, 1917, xv, 788.

The device which the author describes is an innersole which is designed to support the longitudinal arch by means of props in the scaphoid region and also to relieve calluses in the front part of the foot by correcting the anterior arch defects.

It consists essentially of two small metal plates attached to a flexible leather insole, one plate being placed at the heel and prolonged forward on the inner side as far as the scaphoid bone, and the other located just back of the heads of the metatarsal bones, constituting a base upon which to build supports for calluses, rigid toes, and other troubles.

The device is not adapted for routine use by inexperienced persons, since careful fitting is necessary, especially for the anterior defects; otherwise the numerous faults and errors arising from the use of usual store appliances will be encountered.

R. B. COFIELD.

Myles, R. C.: *Aspiration or Vacuum Suction Apparatus*. *N. Y. M. J.*, 1917, cvi, 629.

The author advocates the use of some type of suction apparatus in cases where the ability to swallow or cough has been partially or completely lost and the patient is being practically drowned in his own secretions. He cites one case in which considerable relief was obtained from the use of such an apparatus and two others in which it was of life-saving value.

H. H. FREELICH.

SURGERY OF THE HEAD AND NECK

HEAD

Nichols, E. H.: *Indications for Operation on Traumatic Head Cases*. *Boston M. & S. J.*, 1917, clxxvii, 508.

Nichols makes the following observations regarding operative treatment of traumatic head cases:

1. Uncomplicated œdema of the brain almost never requires operation.
2. Slight laceration of the brain with persisting œdema sometimes requires operation to prevent cerebral degeneration. The subtemporal method is the best operation.
3. Slight extracerebral hæmorrhage seldom requires operation.

4. Extensive extracerebral hæmorrhage from rupture of the middle meningeal artery, with or without focal symptoms, should always be operated upon.

5. Basilar hæmorrhage seldom can be cured by operation. When operation is done, it should be on selected cases for relief of pressure, and usually by skin-bone-flap method.

6. Intracerebral hæmorrhage cannot be cured by operation, although pressure may be relieved.

7. Fracture of the skull, by itself, is of little importance except when compounded, when it may produce meningitis unless made aseptic. All depressed fractures involving the entire thickness of the skull should be elevated. G. W. HOCHREIN.

Moliné and Lannois: Restoration of Facial Mutilations by Strips Taken from the Frontal Region (*Restauration de quelques mutilations de la face au moyen de lambeaux ostéo-périoste-cutanés avec pédicule prélevés dans la région frontale*). *Lyon méd.*, 1917, cxvii, 562.

A transplant to be used in plastic operations on the face must possess the stability desired to reconstitute a skeletal part, with an assurance of vitality. The authors think that the frontal region is most appropriate in every respect. Its structure and extent fulfills almost all needs, its tissue is diploic and highly vascularized, and it is in the vicinity of the part to be repaired. A bone fragment can be removed, leaving its periosteal-cutaneous coverings adherent, and this can be cut in the form of a pediculated strip so that it can be placed where required and still be kept, by means of its pedicle, in relation with the region from which it has been extracted, and which nourishes it.

Five cases of mutilations have been so treated without any mishap, and the results have been excellent.

W. A. BRENNAN.

Kaufman, A. S.: Lateral Sinus Thrombosis. *N. Y. M. J.*, 1917, cxi, 1216.

The author has had five cases of sinus thrombosis under his care which, on account of atypical symptoms, were not diagnosed until the operation.

The routes of infection of the lateral sinus occur in anatomical sequence, as follows: first, direct infection of the jugular bulb. This condition may complicate suppurative otitis media without a true septic involvement of the mastoid process. It occurs in children where the floor of the tympanum is wanting or is in the process of ossification. Second is the involvement of the veins emptying into the sinus, particularly the emissary veins, which become blocked with thrombi. Third and most common is the direct phlebitis following necrosis of the bony structures of the mastoid; and last, the involvement from an acute suppurative otitis media.

The diagnosis is not difficult in typical cases. There is usually a history of an acute or chronic suppurative otitis media. The patient notices a dull, heavy sensation on the affected side of the head for a few days, followed by a chill and a rise of temperature, with a profuse sweat. The temperature may then come down to normal, and the symptoms subside only to recur after a short interval, indicating the presence of general sepsis.

The pathology of this symptom group is explained in the following way: As the clot becomes infected, a small piece separates from the main portion and enters the blood stream, producing the evidence of septic infection. This is shortly overcome by the phagocytic action of the blood. This process is continued until there is involvement of the viscera from metastatic emboli. When the upper part of the clot breaks down, the lower remaining firm, particularly the part in the jugular vein, the symptoms are ushered in without warning. Early and

free incision of the membrana tympani is the proper procedure to follow in trying to prevent an empyema or necrosis of the mastoid. The difficulty of diagnosis arises in cases when otorrhea is apparently the only sign of trouble. "When a discharge continues purulent with the opening in the membrana tympani posterior, and when there is indication of the membrane becoming further destroyed, mastoid extirpation is called for in order to save the patient's hearing and to prevent complications such as the one under discussion."

The author does not believe that it is necessary to uncover the sinus in every mastoid operation, as when the bony wall appears healthy and the patient presents no symptoms of sinus trouble.

In hemorrhagic mastoiditis the discharge from the ear is usually bloody, but in sinus thrombosis the bleeding occurs only after the operative work is begun on the bone.

"There is no harm in exposing a healthy sinus if it is done carefully, while if a diseased condition is revealed, it will serve to prevent a subsequent operation and possibly save the patient's life."

The author continues with the statement that the treatment of the jugular vein is a debated question. He is inclined to agree with those who believe in ligation in every case, unless there is some strong contra-indication to a prolongation of the operation for the following reasons: (1) It is possible that a small piece of infected embolus may be carried into the general circulation, causing further complications. (2) The thrombus may extend down the jugular, and after the clot is removed from the sinus and bulb, free bleeding may come from the inferior petrosal sinus, giving the appearance of a clear sinus and vein; but later the venous clot breaks down and the infected debris is carried into the circulation by the blood coming from the facial vein and other veins below it. The author prefers ligation, but believes that the neck should be opened and the flow through the internal jugular interrupted before the sinus is opened and the clot removed.

M. A. BERNSTEIN.

Hancock, T. H.: Report of a Case of Recovery from a Compound Comminuted, Depressed Fracture of the Frontal Bone, with Loss of Brain Substance. *Internat. J. Surg.*, 1917, xxx, 356.

The case here reported is of a young girl sixteen years of age who was injured in an automobile collision. When examined, it was found that she had sustained a fracture of the skull involving almost all of the perpendicular portion of the frontal bone. The fracture was comminuted and depressed, allowing particles of brain matter to escape. Her four upper and lower incisors were knocked out, and a compound comminuted fracture of the lower maxilla was discovered. She was in extreme shock. No anæsthetic was given, fragments of bone were removed, and the surface was cleansed with sterile water. The laceration in the dura was

not closed, but a rubber drain three-eighths of an inch was inserted, so that both ends protruded from the wound. The skin was closed with silkworm suture. The patient was given supportive treatment, such as enemas, a dose of one-fourth of a grain of morphine sulphate, calomel on the fifth day, and argyrol was applied to the eyes.

A temperature of 100.4°F. developed on the fourth day, which was the result of an infection of the jaw. This was opened and drained. Consciousness returned on the third day. On the tenth day the fractured jaw was reduced under anesthesia. The drain was removed on the fifth day, and the patient from that time made an uneventful recovery.

In commenting on the case, the author asserts that the loss of bone was extensive, and that it was unwise to replace it with foreign material. The fracture was not over the motor area, so that the likelihood of paralysis or epilepsy was not feared. No attempt was therefore made to protect the cortex, as was suggested by Nicolson, who used celluloid plates in place of the removed bone of the skull. The introduction of foreign materials is contra-indicated in compound fractures in any locality, for fear of introducing infection.

M. A. BERNSTEIN.

Real, P., and Gauthier, L.: Prosthetic Treatment of Lower Jaw Fractures (Cura protesetica delle fratture della mandibola). *Ann. di odont.*, Roma, 1917, ii, 479.

In the treatment of fracture of the body of the mandible, if the fracture is recent and the loss of substance not more than 1.5 cm., the authors use a bridge or double arch. If the posterior fragment has no teeth, the reduction appliance consists of a splint cemented on the anterior fragment in normal occlusion with the upper teeth and in a sort of saddle connected with the anterior splint by two pivots. This saddle leans against the posterior fragment, pushing it into normal position.

If the loss of substance is more than 1.5 cm., but not exceeding 3 cm., the posterior fragment is pulled forward; in cases where the loss exceeds 3 cm. the fragments are immobilized in normal position by a double arch and bands.

Fractures of the ramus generally heal without treatment, but in some cases there is a vertical displacement which must be corrected.

When the loss of substance exceeds 3 cm., the fracture cannot heal and pseudarthrosis is almost certain; osteosynthesis or bone grafting must then be tried, and if this fails prosthetics may give some benefit.

W. A. BRENNAN.

Bichelonne, H.: Cranial Wounds (Blessures du crâne). *Arch. de méd. et pharm. mil.*, Par., 1917, lxxvii, 61.

In the military hospital of which the author has charge, 1910 patients with cranial injuries were received between February and August, 1916.

Of these, 967 had been operated upon at the front. The other 963 had apparently only scalp wounds. These 963 scalp wounds were systematically explored by the surgeons at the base hospital and 207, or 21.95 per cent, gave positive results. This large percentage shows the necessity of the systematic exploration of all cranial wounds in war.

W. A. BRENNAN.

Monprofit and Courty: Cranial Gunshot Wounds in War Surgery (Blessures du crâne par projectiles de guerre dans la chirurgie de l'avant). *Arch. de méd. et pharm. mil.*, Par., 1917, lxxvi, 790.

Of 900 wounded treated in the authors' ambulance, 299 were cranial injuries, 144 of these so extensive that they were inoperable; 131 were trepanned. Of the 131 the dura mater was non-perforated in 50 and perforated in 81. The figures show that the proportion of perforated to non-perforated in the whole series was about four to one.

There are various factors which enter into the prognosis as regards life and functional preservation in cranial wounds, viz: the state of the dura; the type of fracture; its position; the presence or absence of projectiles; the extent of cerebral lesions and their position. Of these the more important as regards life are the state of the dura and the presence of projectile particles. If these latter are large, the dura is always more or less extensively ruptured. The real gravity of cranial lesions can only be judged by the study of collected statistics of cases extending over a long period.

The author's 131 trepanned cases resulted as follows: (a) with intact dura mater, trepanned, 49; evacuated, 44; dead, 4; in course of treatment, 1; (b) with perforated dura mater, trepanned, 82; dead, 42; evacuated, 32; in course of treatment, 9.

These figures show the value of the condition of the dura with regard to prognosis.

With regard to intracranial projectiles, until recently their presence was considered fatal, but recent views have shown that wounded men with a retained projectile have no higher mortality than those cases in which the projectile has passed through; and that the mortality in cases where a projectile has been immediately extracted does not seem less than in similar injuries where the projectile was not extracted.

Marie has stated that he observed 31 old cases with intracranial projectiles, in 29 of which there was absolute tolerance and in only 2 cases were there epileptiform crises.

W. A. BRENNAN.

Harris, C. T., and Nissen, H. A.: A Series of Fractured Skulls from the Surgical Records of the Boston City Hospital, 1902-1917. *Boston M. & S. J.*, 1917, clxxvii, 870.

The statistics of the Boston City Hospital here given are from 1902 to 1917.

A diagnosis of fracture of the skull was made 540 times.

The paper deals with the definitely proved cases, which comprise 314. The causes as given in the histories were as follows: accident, 271 cases; alcohol, 66 cases; suicide, 8 cases; assault, 15; and unknown, 1 case.

The type of injury was as follows: simple fractures, 186 cases; compound fractures, 147; depressed fractures, 114.

The number of operative cases were 48.7 per cent, non-operative cases, 51.3 per cent. Of 123 operated cases, 60 were relieved and 63 died. Of the 207 non-operated cases those relieved were 114, while 93 died. The deaths which resulted from one to several weeks after operation were due to septic meningitis, erysipelas, pneumonia, brain abscess, and delirium tremens. The compound fractures required immediate operation, at least within twenty-four or thirty-six hours after the time of the injury. The simple fractures, unless definite depression was made out, were operated upon from thirty-six hours to ten days after injury.

The operative indications were: (a) increasing intracranial pressure, (b) nausea, vomiting, choked disk, or focal signs.

Fracture of the temporal bones occurred in fifty cases, or 15.1 per cent. Fracture through the bony wall of the auditory canal was found in many. Bleeding from one or both ears was not considered a diagnostic sign.

Fracture of the occipital bone occurred in thirty-five cases, or 10.7 per cent. The operative results in thirteen compound fractures were three recoveries.

Fracture of the base occurred in sixty-four cases, or 10.4 per cent.

The percentage of cases relieved was inversely proportional to the change from the normal mental condition. In those cases where there existed dilated or fixed pupils, the prognosis was unfavorable. In those cases in which a small portion of bone was removed, the dura being left intact, the pressure symptoms did not clear up. Thus, the author concludes, for a complete decompression it is necessary not only to open the bone structure, but also the dura as well. Suture of the lacerated dura was not successful because of the inability to approximate its edges. There was no advantage in using a rubber drain, since immediate closure of the dura followed with as good results. In those cases where a rubber drain was used, infection followed with a fatal termination.

In conclusion the author emphasizes the following points:

1. Routine two-hour blood-pressure readings, for the first twenty-four to forty-eight hours.
2. Lumbar puncture in all cases.
3. Fundus examination at entrance.
4. X-ray examination of all head injuries.
5. Withholding of morphine until a definite diagnosis is made.
6. Thorough neurological examination.

M. A. BERNSTEIN.

Lapayre, N.: **End-Results of Trepanations for War Injuries** (*Résumé des résultats des trepanations pour plaies de guerre*). *Bull. et mém. Soc. de chir. de Par.*, 1917, *clin.*, 2048.

Lapayre's report includes 20 cases of cranial injury without dura mater lesions. All have recovered after trepanning. The condition two years later shows that 19 have returned to military duty. There were 40 cranial encephalic wounds, 27 of which died of infection within fifty days after operation. None died later, so that the prognosis of definite recovery after an interval of sixty days is very probable.

No plastic operations have been done on the survivors. Two required a secondary operation, one for hernia and the other for epileptiform seizures. Only two of the thirteen can be said to be definitely cured. The others have a greater or less degree of cephalalgia and vertigo. Marked aphasia in two cases has almost disappeared, as have slight motor-sensory disturbances in three other cases. However, complete paralysis in one case remains.

Complete recovery therefore is very rare in penetrating cranial wounds, but when the lesion is in the rolandic zone, the subsequent troubles are slight and are compatible with an active life.

The series of cases has shown that the factor of seriousness in a cerebral lesion is its depth rather than its extent, which follows from the difficulty or impossibility of complete disinfection.

Derache recently reported the psychological examination of 24 old operated cases. Four were normal, 13 subnormal, and 7 intellectually deficient.

The future of trepanned cases must be considered from two points of view. As regards survival, infective complications become more rare, the more removed the case is from the time of injury. From the psychic standpoint the prognosis is very poor.

In discussing the report, Tuffier said that the question of the accidents consecutive to craniocerebral wounds had been taken up at the Interallied Surgical Conference. The facts showed that grave infection in craniocerebral wounds was much more rare than was supposed.

In more than 6,000 cases reported, there were 676 partial epileptic seizures, 94 late cerebral abscesses, 32 cases of late meningitis, and 54 cases of late cerebral hernia.

W. A. BRENNAN.

Elsberg, C. A.: **Chronic Internal Hydrocephalus; the Newer Methods for Its Recognition and Treatment**. *Intern. M. J.*, 1917, *xiv*, 1114.

The name hydrocephalus originated with the earliest medical authors, who included under this term a large variety of pathological conditions, varying from hematoma of the scalp to distension of the ventricles of the brain.

Investigations have shown that the main, if not the only, sources of the cerebrospinal fluid are the choroid plexuses of the ventricles which Mott calls "choroid glands," that the secretion is almost constant, and that its rate varies and is influenced by a number of factors. The rate of flow in animals is

increased by asphyxia, by anaesthesia, and by many drugs and organ extracts, especially by extracts of choroid plexus or brain tissue. The only glandular substance known to have a specific inhibitory effect on the secretory activity of the choroid plexus is thyroid extract.

Under normal conditions the cerebrospinal fluid leaves the ventricles and is absorbed from the subarachnoid space of the brain and spinal cord directly into the blood stream. Investigators have shown that no fluid is absorbed by the walls of the ventricles, that perhaps a little may enter the blood stream by the veins of Galen, but that the greater part is absorbed by the villi of the arachnoid membrane over the convexities of the brain.

Experimental and clinical evidence shows that there is a circulation of cerebrospinal fluid and that it follows a regular course, passing from its source in the lateral ventricles into the third and through the latter into the fourth ventricle, leaving the fourth ventricle by the foramina of Magendie and Luschka, the greater part of the fluid passing downward in the spinal canal on the posterior aspect of the spinal cord. There is believed to be a steady flow of fluid downward behind the spinal cord and upward on its anterior surfaces spreading over the convexities of the hemispheres where it is absorbed into the blood stream.

This scheme of circulation shows why spina bifida is so apt to be complicated by hydrocephalus, and why the hydrocephalus is so apt to become aggravated after operative treatment of the spinal condition. In spina bifida there is an obstruction to the downward passage of fluid in the spinal canal and hence a retention of fluid in the ventricles.

The amount of fluid in the ventricles and in the subarachnoid space is kept within normal bounds by the proper balance between the amount secreted by the choroid plexus and the amount absorbed by the arachnoid villi. If the secretion is retained in the ventricles by an obstruction in the aqueduct of Sylvius or in the foramina of Magendie and Luschka, then the fluid collects in the ventricles, the latter becomes distended and the typical obstructive internal hydrocephalus results.

If there is either a hypersecretion of fluid so that more is secreted than can be taken care of by the arachnoid villi, or if the absorptive power of the arachnoid is diminished, or a combination of these two conditions obtains, the secretion collects and distends the ventricles, producing the non-obstructive hydrocephalus, which is divided into that due to hypersecretion and that due to diminished absorption.

The term hydrocephalus almost always means internal hydrocephalus, no matter whether the retention of fluid is due to obstruction, diminished absorption, or hypersecretion. A slight increase of fluid in the subarachnoid space over the hemispheres is sometimes met with, but considerable fluid worthy of the name of external hydrocephalus is exceedingly rare.

To the three different types of hydrocephalus,

that due to obstruction, that due to diminished absorption, and that due to hypersecretion, Frazier adds a fourth type which he calls "occult hydrocephalus," the accumulation of fluid in this variety being due to lack of balance between the secretion and absorption of the cerebrospinal fluid.

For the differentiation of these various types a method has been devised, using phenolsulphonephthalein as an indicator. Normally, phenolsulphonephthalein introduced into the ventricles appeared in the urine in from ten to twelve minutes, and during two hours 12 to 20 per cent was excreted. Introduced into the subarachnoid space, the dye appeared in the urine in from six to eight minutes and 35 to 60 per cent was excreted in two hours. The dye passed readily from the ventricles to the subarachnoid space, and appeared in the spinal fluid in from one to three minutes.

A lumbar puncture is done, a cubic centimeter of fluid is withdrawn, and one ccm. of sterile neutral phenolsulphonephthalein is injected. If less than 30 per cent of the dye is excreted in the next two hours, there is diminished absorption from the subarachnoid space. In several of the patients not a trace of dye appeared in the urine in four to six hours.

In a few the ventricular injection was made. In infants the ventricle is punctured through the lateral angle of the anterior fontanelle, one ccm. of fluid withdrawn and one ccm. of phenolsulphonephthalein injected. A spinal puncture is then made and if the dye fails to appear in the spinal fluid within ten minutes, the case is one of obstructive hydrocephalus.

To determine whether or not there is hypersecretion of the cerebrospinal fluid, a spinal puncture is done every day or every other day. When the secretion is normal, the quantity and pressure of the fluid becomes steadily less after the first two or three punctures. In hypersecretion, however, the amount of fluid obtained and the pressure under which it escapes remains constant for long periods.

Unilateral obstructive hydrocephalus from obstruction of the foramen of Monro undoubtedly occurs.

The forty patients with chronic hydrocephalus were divided as follows: obstructive hydrocephalus, 10 cases; non-obstructive hydrocephalus, 30 cases; non-obstructive, diminished absorption, 18 cases; non-obstructive hypersecretion, 6 cases; non-obstructive, diminished absorption and hypersecretion, 6 cases.

Many methods of treatment have been tried, many attempts have been made to drain the fluid from the ventricles to the pleural cavity, to the retroperitoneal cellular tissue, to the venous circulation, to the subdural space, and to the subcutaneous tissues of the scalp, but all failed regularly. Drainage to the outside of the body is an old method which Henschen in 1911 concluded, after an exhaustive study, is fatal in 90 per cent of patients.

In hydrocephalus due to obstruction, puncture of the corpus callosum has given very satisfactory results, and a complete cure may be effected.

In patients with hydrocephalus due to hypersecretion, a lumbar puncture should be done every few days, and the patient given thyroid extract in increasing doses up to the physiological limit. The author considers the thyroid treatment of great value and has seen a number of very satisfactory results in this type of hydrocephalus from the combined treatment of thyroid feeding and repeated lumbar puncture.

The cases of hydrocephalus due to diminished absorption are the most unfavorable cases for treatment and there are no satisfactory methods of gaining relief.

In those who have had a chronic hydrocephalus the size of the head will always remain larger than normal, although its circumference may diminish considerably if the treatment is successful. Under successful treatment papilloedemata will subside rapidly and improvement in the eye grounds and vision occurs. Ataxia of long standing requires years for its complete disappearance. V. C. HUNT.

Valabregar, M.: Primary Pneumococcal Cerebral Abscess (*Absceso cerebral primitivo apneumococcal*). *Pediatr. japon.*, Madrid, 1917, vi, 247.

A child of seven years had an attack of jacksonian epilepsy predominating in the left upper limb, accompanied by headache and vomiting. There was neither paralysis nor fever. The spinal fluid was normal. The child suddenly became comatose with rigidity of the neck, Cheyne-Stokes respiration, Kernig's sign and clonic contractions in the right hand, and died after a few hours.

Autopsy showed adhesions of the dura mater about the left frontal lobe region. On separating these an abscess was found occupying the left frontal lobe and containing about 100 gr. of pus. Pneumococci were found in the pus. There was no apparent otitis, nor any pulmonary process. The cerebral abscess was apparently primary and due to the pneumococcus. W. A. BRENNAN.

Besta, C.: Ether Narcosis in Cerebral Wounds (*Narcosi eterea in feriti cerebrali*). *Gazz. d. osp. e d. inf.*, Milano, 1917, xxxviii, 711.

Besta refers to some singular phenomena observed in soldiers operated for cerebral injuries during ether narcosis.

It is already known that in cases of cerebral lesion during chloroform narcosis the patellar reflex can persist, as well as contracture of the limb, due to the cerebral lesion. But during ether narcosis in patients affected with cortical lesions there is the occurrence of more or less intense contractures associated with a sharp augmentation of reflex excitability to mechanical stimuli in determined muscle groups, and which are not shown when the individual is awake. These facts are strictly related to the cerebral zone injured and occur exclusively in cases of injury to the rolandic zone, not being observed in injuries to other regions. There is also an undoubted relation between the

location of the functional lesion and that of the contractures.

The author refrains from a discussion until other observations have been made and the clinical effects compared and discussed. W. A. BRENNAN.

Senise, T.: Experimental Regional Obliteration of Cerebral Vessels (*L'obliterazione sperimentale regionale dei vasi cerebrali*). *Ann. di neur.*, Napoli, 1917, xxxiv, 81.

Senise gives a historical review of the various methods adopted for the experimental study of the functions of the nervous system, especially of the brain, namely, methods of destruction, methods of stimulation, methods of inhibition, and methods of compression.

He proposes a new method, the experimental regional obliteration of cerebral vessels, or the experimental anemia of a selected cerebral territory. He suggests opening the cranium of a higher mammal at a given point with the trepan or scalpel, and under rigorous asepsis to ligate the artery or arteriole corresponding to the selected trepanned point which irrigates a certain field or cerebral territory; and then to observe the consecutive nervous disturbances. He finds in literature that Vulpian and others studied the effects of anemia on the brain by injection of air or lycopodium powder into the carotid; but his proposal differs from this, and has, he thinks, many advantages. W. A. BRENNAN.

NECK

Wohl, M. G.: Carcinoma of Lateral Aberrant Thyroid. *Intern. M. J.*, 1917, xxiv, 1044.

By an aberrant thyroid is understood thyroid tissue that is normal or abnormal, and not connected with the thyroid gland itself, occurring along the path occupied by the gland during its embryonal development. This definition excludes thyroid tissue found in the pleura, or in the bones and the abdominal cavity. Thyroid cells may become dislodged and remain along the duct, giving rise to the median aberrant thyroids, designated superior or inferior according to the location above or below the hyoid bone.

The origin of lateral aberrant thyroid is a matter of speculation, since the ability of the lateral anlage to produce thyroid tissue has been refuted. The most plausible explanation for its occurrence is that during fusion of the ultimo-branchial bodies with the median anlage, islands of cells become detached from the lateral portions of the median anlage and remain dormant until later in life, when for some reason they commence to grow and initiate pathologic processes.

The author reports the case of a female, aged 19, who noticed two years previous a small lump on the right side of the neck. There was no pain. The tumor had grown a little lately. Physical examination showed a small, hard, roundish tumor just beneath the anterior edge of the right sternomastoid

muscle on a level with the hyoid bone. It was not quite as large as a small bantam egg. The tumor had a cartilage-like feel; it was freely movable from side to side and also up and down. The thyroid gland was apparently normal. When removed, the specimen consisted of five nodules varying in size from a pea to a pecan, encapsulated and interconnected by connective-tissue bands. Microscopic examination revealed papillary adenocarcinoma of the thyroid tissue.

The author states that carcinomatous proliferation of the lateral aberrant thyroid is very rare, there being only five such cases reported in the literature. His own patient was the youngest case ever recorded. The preponderance of the female sex over the male is five to one.

The surgeon should bear in mind in the differential diagnosis of tumors of the neck the possibility of a lateral aberrant thyroid, especially if the patient is a female and the tumor has a tendency to fluctuate during menstruation. Before the tumor is removed, unless carcinomatous, as shown by rapid growth and infiltration of neighboring tissues, the presence of a normal thyroid should be ascertained, as the aberrant thyroid may be the only one that the patient has.

P. G. SKILLERN, JR.

Miller, C. S.: Exophthalmic Goiter. *N. Y. M. J.*, 1917, CVI, 1210.

Statistical deductions made by Miller state that deaths from diseases of the thyroid gland in Philadelphia from 1906 to 1915 inclusive show that the proportion of exophthalmic goiter to other diseases of the thyroid was three to one. He further asserts that disease of the thyroid gland is increasing. Hardilicka, of the United States National Museum, has shown that in certain portions of the Indian tribes, goiter exists at the rate of 3 per 1,000, while in portions of the negroes, it exists at the rate of 61 per 1,000. The statistics which Hardilicka cites are those from the United States, England and Wales.

The greatest number of deaths from goiter occur between the ages of forty and forty-nine. The explanation for the deaths occurring at this period of life, the author believes, are due to the mental and physical strain incident to active adult life.

The death rate from goiter is higher in cities, which can be explained by the fact that city life is associated with a greater strain. The idea that infected water or water rich in certain minerals is a direct cause of goiter has not been proved to be true, and the density of population has little or no effect on the prevalence of goiter.

The author concludes with the following summary: Inasmuch as it develops in persons subject to nervous strain, possibly due to the influences of their environment and at a period of life when this strain is most acute; and from the indications of overactivity of this gland as presented normally in certain states of health such as pregnancy and menstruation, it is reasonable to infer that all causes point to the development of some poison within the

body due to faulty metabolism. In turn, this faulty metabolism of the body is influenced by the habits and life of the individual. Therefore the theory that nervous enervation or nervous control is directly responsible for the development of goiter in its various forms and the nervous symptoms manifested in a well developed case are in turn secondary to the reflex effect of the goiter constitutes a vicious circle.

M. A. BERNSTEIN.

Dunhill, T. P.: Discussion of the Surgery of Exophthalmic Goiter. *Lancet*, Lond., 1917, CCXII, 883.

Dunhill has performed the operation for removal of thyroid tissue in fifteen hundred cases. In his paper he discusses the theories which are maintained regarding hyperthyroidism and the removal of thyroid tissue for its relief.

Mackenzie is quoted as saying that if it were certain that the cause of the disease is hypertrophy and overactivity of the thyroid gland, removal of the gland would be the most rational treatment.

McGarrison maintains that Graves' disease is not essentially due to thyroid gland activity.

Farrant says that if hyperthyroidism were recognized and treated from one to three years earlier, Graves' disease would cease to exist.

Kocher, the Mayos, Crile and the author believe that the disease can be practically cured by removal of sufficient thyroid tissue when there has not been visceral degeneration, and that it can be greatly ameliorated in cases when this has occurred.

The author also says that while the cause of Graves' disease is yet not known, it cannot be denied that the disease is a manifestation of excessive and disordered functional activity of the thyroid glands. By removal of a sufficient amount of the gland, its hypersecreting action is overcome. Sufficient gland tissue can be left to continue the physiological requirements of the body.

The author was converted to the surgical treatment of exophthalmic goiter eleven years ago. He had had six cases under observation. They were treated medically with no benefit. One case was operated upon and the right lobe was removed. The patient made a remarkable recovery. The other five were immediately operated upon with good results. All these cases were operated upon under local anæsthesia. The author later became convinced that if sufficient gland tissue is removed, the symptoms disappear and the patient is restored to health.

Kocher is quoted as saying in 1907 that it is rarely necessary to resect a part of the remaining gland after excision of one side, and he has cured 83 per cent of all his cases. The author did not find this true in his practice. While the patients showed general improvement and an amelioration of all symptoms resulted, they were not definitely cured. It was found necessary in some cases to remove sufficient gland tissue to place the patient on an "industrial" plane.

The author is of the opinion that it is hardly possible to estimate the size of the gland during the operation, since the gland does not permit free exploration, being anatomically so situated that its proportions cannot be definitely determined. It was found that after removal of one lobe, symptoms would still persist indicating toxic absorption. It then became necessary to perform a second operation to relieve the remaining symptoms. In one case where two operations were performed and the patient made a fairly good recovery, there was nevertheless a remaining tremor and a rapidity of the heart. She was again operated upon and a portion of gland tissue removed from behind the trachea:

this tongue-like process from the middle lobe was previously described by the author.

In conclusion, the author states that he has always found the removal of one lobe and the isthmus sufficient to give unquestionable improvement. The removal of rather more than half the remaining lobe almost always places a patient in a state of health which enables her to work and play and to feel well while doing so. Occasionally a third operation is necessary.

The author cites several interesting and instructive cases demonstrating unusual symptoms of emaciation, extreme proptosis, and marked disability.
M. A. BERNSTEIN.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Gask, G. E., and Wilkinson, K. D.: Penetrating Gunshot Wounds of the Chest and Their Treatment. *Brit. M. J.*, 1917, ii, 781.

This paper is concerned especially with the treatment and cause of death of 365 cases of chest injuries, covering a period of eighty-five days, of different phases of warfare. All cases of penetrating wounds of the chest coming to the casualty clearing station are included, no matter how serious the complication. The cases have been followed to the base or to England, so that base mortality is included.

Disregarding complicating wounds, the causes of death are classified as follows: (1) death in a few hours from very extensive and severe injuries which can seldom be aided surgically; (2) death in the casualty clearing station after a few days, usually from local sepsis; (3) death at the base from sepsis. Prolonged illness is also almost always due to sepsis. Treatment should therefore be directed toward elimination of infection in chest wounds, as in any other wound.

The infection is carried in by the missile, cloth and splinters of bone, by air sucked in, or by extension in an open wound. If there is a large open wound through which air is sucked, immediate temporary skin suture is attempted without anesthesia. All other cases are allowed to rest for one or two hours to recover from shock. The patient is then examined and if the missile is retained, an X-ray is taken.

The indications for early operation are: (1) a ragged wound of the soft parts; (2) compound fracture of the ribs; (3) bleeding from a parietal wound; (4) suction of air into the pleural cavity; (5) retention of a large foreign body in an accessible position; (6) pain, often from splinters of a rib scratching the lung; (7) rapidly increasing hemothorax complicating pneumothorax.

Small clean wounds, including those with small

retained missiles, are treated on general medical principles. Hemothorax, if large, is aspirated. If clinical signs of infection develop, i.e., rising pulse, fever, increase in effusion or pneumothorax, a sample of blood is removed for bacteriologic examination. Cyanosis is treated by the inhalation of oxygen for five or ten minutes every half hour. "Valve pneumothorax" is treated by early suture. Surgical emphysema, often present, requires no treatment. Air in the anterior mediastinum may cause an absence of precordial murmurs which may closely simulate pericarditis. Massive collapse of one lobe of the lung without known cause may occur.

Operation is performed as soon as possible after recovery from shock. Wounds of the soft parts, unless perfectly clean, are excised. Splinters of bone are removed and sharp edges of bone trimmed. The chest is closed in layers. If part of the pleura is missing, muscle is used to bridge the gap, or if necessary, a skin flap from elsewhere. The chest must be closed.

Foreign bodies, not including rifle balls, are usually shell fragments one inch by one and one half, as a rule associated with pieces of rib and clothing. The choice of route for the removal of a foreign body depends on its position relative to the wound of entry. When possible, thoracotomy through the wound is preferred or by fresh intercostal thoracotomy or with removal of the rib. The easiest route is probably the fifth rib in mid- or anterior axillary line. If the foreign body is not visible, the hand is introduced to feel for it. Lung tissue is incised and sutured as necessary. The blood of a hemothorax is evacuated. Bleeding does not recur even as early as twelve hours after injury.

Repair of the diaphragm is best done from above, then any necessary repair of an injury to hollow viscera is executed from below. With multiple injuries of the chest and abdomen, it is probably better to deal with the abdomen first, but the chest should if possible be attended to at the same operation.

Infected hæmothorax can be prevented in some cases by careful excision of the wound. Infection with anaerobic bacilli is the most benign, mixed infection is always severe, streptococcic, especially if hæmolytic, is most dangerous. A diagnosis of infection is rarely made before the third day. The only positive evidence is a foul-smelling fluid and positive cultures. Clinical signs may appear before a culture can be obtained from the fluid. Treatment calls for ample incision, washing the cavity with eusol, then closing the chest in layers. If closure is effected, it may remain closed and become sterile. The lung expands and adhesions form to hold it out. Respiratory distress is also much less. If infection persists, as determined by postoperative examination, it should be opened and drained.

Any patient on whom an intrathoracic operation is to be performed should have general anaesthesia. Chloroform is generally used in these cases.

Contra-indications to operation are: (1) shock and collapse, if persistent and marked; (2) small, clean wounds without evidence of serious injury; (3) retention of a small body in the lung or mediastinum; (4) collapse of the opposite lung as indicated by inspiratory retraction of the chest wall on the other side.

The usual operative technique is a six-inch incision over the wound or at a site more favorable, with the resection of four inches of rib. An alternate method is intercostal incision with a rib spreader. The pleural cavity is palpated and cleansed by inserting the whole hand. The wound in the lung is next explored and the wound sutured. If necessary, a wedge of lung tissue is first excised.

The total number of cases was 365 and of these 76, or 20.8 per cent, died and 289 recovered.

Deaths from complications of the chest wounds were as follows: head, 6; abdomen, 14; spine, 4; heart, 4; large systemic vessels, 2; multiple wounds, 14; lethal gas, 1; making a total of 45 cases.

Causes of death from chest injuries were as follows: shock and hæmorrhage, 19; sepsis, 10; bronchitis, 2; making a total of 31 cases or 9.6 per cent.

General results may be summarized as follows: There were 104 cases operated upon, of which 83 recovered and 21 or 20.2 per cent died. The number of cases not operated upon were 261, of which 206 recovered and 55 or 21.07 per cent died.

C. A. HEDBLÖM.

Hathaway, F. J.: The Early Operative Treatment of Penetrating Gunshot Wounds of the Chest. *Brit. M. J.*, 1917, II, 582.

Prompt recognition of suitable cases and early operation in chest injuries saves many lives and shortens convalescence. Clean through and through wounds caused by rifle bullet or shrapnel may require aspiration of the hæmothorax but not early operation. Large exit wounds caused by such missiles striking bone should be sewn up if possible, after removing all loose fragments and excising the

wound edges. Tangential wounds with fragments of rib and pleura driven into the pleura, lung, and sometimes penetrating the diaphragm must be cleared of damaged tissue, cleansed, and the diaphragm closed. Damaged tissues in large through and through wounds caused by shrapnel or high explosives must be excised and the wounds closed if possible by sutures. Rifle bullets or shrapnel balls retained in the chest may be left unless sepsis ensues. Large jagged pieces of shell causing much laceration and carrying in fragments of clothing must be excised if accessible.

Accurate X-ray localization is essential. Novocaine is the best anaesthetic. No intratracheal pressure apparatus is necessary. Wide exposure is essential. If there is already a large opening with pneumothorax, the hand is introduced and the foreign body removed. If the opening in the pleura is small with but little sucking of air, a small incision is made and the lung grasped with toothed forceps and pulled into the incision. The hæmothorax can then be evacuated and any metal fragments seen or felt can be removed. If imbedded in the lung, the track of the missile is followed up with a knife or cautery, or the finger is inserted. Any hæmorrhage is controlled, and the wound in the lung, if large, is sutured. The pleural cavity is washed out with Dakin's solution or flavine. If possible, the pleura is then completely closed, leaving any infection "to be dealt with by the natural power of the pleura to dispose of infection," which has been shown to be very strong. If there is a gap in the parietal pleura it may be stitched to the lung and visceral pleura. Where skin edges cannot be brought together, the wound is firmly packed.

"In general treatment of wounds of the chest follows the same line as those of the abdomen, head, knee, or other joints; they require just as early operation and it will be found that results are just as good."

C. A. HEDBLÖM.

Rosini, L.: Cancer of the Male Breast (*Cancro della mammella dell' uomo*). *Gazz. med. di Roma*, 1917, xliii, 261.

Rosini reports a case of carcinoma of the breast in a man forty years old. Examination showed the left breast increased to the size of a small melon. The skin showed large veins radiating from the mammary areola. The tumor was only slightly mobile, hard on palpation, but fluctuant in a point toward the apex about the size of a 5 centesimi piece. The surface of the skin here was bluish in color. Two hard glands were noted in the axilla. There was a bloody discharge from the nipple. The symptoms and the history of the case suggested carcinoma and radical removal was done.

Microscopic examination of the tumor showed infiltrated epithelial cords in the atrophied acini of the mammary gland and the presence of fibrous connective tissue with numerous epithelial columns in the lymphatic spaces. The man remained well for some months, but died with the phenomena of

pulmonary metastases. The author thinks it is probable that this case originated in a slight trauma. Tricomi found that among 751 tumors of the male breast, 649 were carcinomata. W. A. BRENNAN.

Fay, O. J.: Traumatic Injuries to the Thoracic Duct. *Indiana M. J.*, 1917, xviv, 1033.

Reviewing the literature of this subject, the author takes up the mechanism of the injuries, their site and character, symptomatology, diagnosis, prognosis, and treatment by suture, implantation, ligation, tamponing, and acupressure.

Regarding treatment, suture of the duct is the procedure of choice. Where suture is impossible, the duct should be ligated, or clamped with forceps. Where neither of these procedures can be successfully carried out, because of the general condition of the patient or the difficulty encountered in locating the injury to the duct, the wound should be firmly tamponed.

In the treatment of injuries to the duct within the thorax, exposure with suture or ligation of the duct is impracticable; conservative treatment is a matter not of choice but of necessity. The first aspiration usually precedes diagnosis, whether it be undertaken purely for diagnostic purposes, or for the relief of dyspnea and other distressing symptoms of an intrathoracic effusion. Repeated aspirations are necessary whenever this increased pressure threatens life, but only then, for following aspiration the fluid is usually replaced with great rapidity, the negative pressure within the thorax favoring its escape; and the body is thus deprived of an economically valuable fluid, capable of being absorbed, without any compensating mechanical relief. It may also be assumed that the pressure exerted by the escaped fluid upon the thoracic duct serves in some measure as a tampon, thus favoring the development of a collateral circulation below the point of injury.

To combat the loss of nutrient chyle, the patient's strength must be maintained by generous feeding.

P. G. SKILLERS, JR.

Larralde, A.: One Thousand Applications of Artificial Pneumothorax (Un millar de aplicaciones del pneumothorax artificial). *Gac. méd. de Cardiac*, 1917, xxiv, 179.

Larralde gives his personal experience with the Forlani method of artificial pneumothorax since March, 1914. He made a thousand insufflations in about one hundred patients.

The indications for pneumothorax are chiefly two: (1) in acute forms such as those of caseous, fibrocascous, ulcerous, cavity, caseous pneumonia and tuberculous bronchopneumonia; (2) in pulmonary hemorrhages. It is contra-indicated in hyperacute generalized forms and in bilateral lesions.

Radiography should be used: (1) before applying pneumothorax to know if it is indicated, and to

show where the puncture should be made; (2) to follow the progress of the pneumothorax and to fix the time of renewing insufflations; (3) to diagnose pleural adhesions.

Of the 100 patients treated by Larralde, 68 have been followed. In all cases where pneumothorax has been applied for hæmoptysis the result has invariably been gratifying. When the insufflation was sufficient, hæmorrhage ceased immediately. When adhesions caused difficulty in the penetration of the gas, the insufflation was repeated about four hours later. The second administration is generally easier and permits a larger amount of gas to be introduced.

In all cases of tuberculosis, pneumothorax has always been effective in acting upon the fever, digestive disturbances and the general state, when the quantity of gas introduced has been sufficient to cause compression.

Of the 68 cases followed, 18 have been for two and one-half years without any symptoms of the recurrence of the disease. Eighteen cases have shown improvement; 4 cases have been without result. In 20 cases it was impossible to realize the pneumothorax, or useless to continue it owing to the patient's state. In 8 cases there was a prolongation of life, but the patient ultimately died from the disease. In all these cases the patient had derived no benefit from hygienic and medical treatment.

The author gives his opinion that there is no other method which in acute febrile progressive infiltrating and cavernous tuberculosis can give such results as those indicated; and he therefore thinks that the Forlani method is the most effective method available for the treatment of pulmonary tuberculosis.

W. A. BRENNAN.

Péhu and Daguet: Clinical and Radioscopic Researches on the Remote Sequelæ of Pleural Effusions, Traumatic or Spontaneous (*Recherches cliniques et radioscopiques sur les séquelles lointaines des épanchements pleuraux traumatiques et spontanés*). *Ann. de méd.*, Par., 1917, iv, 425.

Very little work has been done in the radiologic study of the end-results of pleural effusions, especially traumatic. During the war the authors had occasion to observe and study both spontaneous and traumatic effusions, and they desire especially to make comparisons between the different varieties.

Altogether the authors studied 152 cases of pleural effusions by radioscopy. These were cases of hæmothorax or purulent pleurisy due to penetrating war wounds of the chest, emphysema consecutive to acute lobar pneumonia, or spontaneous serofibrinous pleurisy of almost certain tubercular nature. They desired to ascertain what traces of the condition remained in the pleura or in the lung after a considerable interval varying from a few months to a few years, the effusion having ceased to evolve. The conclusions to which the study of their cases led them are thus formulated:

1. Simple hæmorrhax due to war wounds, which have not suppurated, leaves in general no persistent traces either on the pleura, on the diaphragm, or on the lung. Extensive hæmorrhax, however, which has persisted despite several punctures, may in undergoing organization after the manner of hæmatomata of the dura mater produce extensive adhesions between the two folds of the pleura; but this is exceptional.

2. Cases of purulent pleurisy consecutive to pyothorax after penetrating wounds of the chest, even if accompanied by prolonged or fistulous supuration, leave behind a condition of limited adhesions between the pleural folds, such adhesions as a rule gradually becoming attenuated. It must however be observed that if intervention is carried out early and the site of incision well chosen the pleural cicatrix will be less extensive. The same applies to purulent pleurisy consecutive to acute lobar pneumonia.

3. Spontaneous serofibrinous pleurisy of tubercular origin, either alone or associated with pulmonary lesions, leaves behind extensive adhesions which are sometimes generalized over the entire surface, and which disappear very slowly. Their persistence is much greater than the previous variety.

4. The existence of these various kinds of adhesions may be clinically manifested. By radio-scopic alone their extent and their influence on the respiratory function can be demonstrated.

Of the 152 cases reported 108 were spontaneous pleurisy of tubercular nature, 3 were metapneumonic purulent pleurisy, and 41 were traumatic pleural effusions.

W. A. BRENNAN.

TRACHEA AND LUNGS

McCannel, A. D.: Bronchoscopy and Oesophagoscopy. *J. Lancet*, 1917, xxxvii, 704.

The instruments in use today for bronchoscopy and oesophagoscopy are of two kinds: those without lighting apparatus, the light being projected from without into a tube; and those in which the light is part of the instrument; the latter are preferable. Bronchoscopy and oesophagoscopy are done for diagnostic and therapeutic purposes, usually under cocaine anaesthesia in adults and preferably under general anaesthesia in small children.

The diagnosis of a foreign body in the air passage usually depends on the symptoms of cough, usually paroxysmal and constant, dyspnoea, usually inspiratory but sometimes expiratory or both, and always worse during paroxysms of coughing, elevation of temperature from irritation and later from septic absorption from a localized inflammatory area or from such complications as pneumonia. Pain is often noted but is apt to be vaguely localized.

X ray examination is of great value if the foreign body shows opacity to the ray. Physical signs if

present are valuable often in indicating the side the foreign body is on, especially in the case of negative roentgenograms.

H. H. FARLEIGH.

Olivier, R.: Fifteen Late Extractions of Intrapulmonary Projectiles (A propos de quinze extractions de projectiles intra-pulmonaires chez d'anciens blessés). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 2080.

In the 15 cases operated upon by Olivier the extraction was made at least five months after wounding. Local anaesthesia was employed in all cases. Three of the cases were operated upon by the Duval method by the transpleural route with pneumothorax. Two of these cases recovered only after a purulent pleurisy, and the third after a serous pleurisy. The author thinks this method should be accepted only as a necessity where a wide field of vision is indispensable. Marion's method has been employed in 8 cases. In this the projectile is directly extracted after a prior fixation of the lung to the thoracic wall. All these patients recovered in from ten to fifteen days. In a few cases Olivier employed the method of Petit de la Villeon, in which the extraction is made by the forceps under radiologic control. This method is rapid and less bloody than others, as the muscular and bony tissues are scarcely involved, surgically speaking.

For projectiles situated in the hilum region, Duval's method is applicable. For projectiles outside the hilum region and accompanied by suppuration, hæmoptysis, abscess, etc., Marion's fixation method should be employed. Petit de la Villeon's procedure is excellent on condition that the hilum is not approached and that there is neither inflammation of the lung, hæmoptysis, nor pus in the sputum.

As regards the end-results, the first two methods showed always the existence of pleural reaction even when the postoperative course was apparently otherwise excellent. Such reaction may be demonstrated radiographically by marked obscurity of the pleural cul-de-sacs and immobility of the corresponding hemidiaphragm. Such end-results are entirely lacking when Petit de la Villeon's method is followed, and this method has therefore in this respect great superiority over the others.

W. A. BRENNAN.

HEART AND VASCULAR SYSTEM

Escande, F., and Brocq, P.: Two Cases of Projectiles Well Tolerated in the Walls of the Heart (Deux cas de projectiles inclus dans les parois du coeur et bien tolérés). *Rev. de chir.*, Par., 1917, lii, 268.

The author reports two cases of projectiles found lodged in the wall of the heart and well tolerated. In one case the projectile, a rifle bullet, was radiologically fixed in the lower narrow part of the

left ventricle. In the second case a fragment of shell was similarly demonstrated in the anterior wall of the heart.

Since the beginning of the war 14 cases of this kind have been published. In 7 of these the projectile was lodged in the heart wall and in 7 it was more or less free in a cavity. In 5 of these 14 cases the tolerance was almost perfect. Seven were operated upon, of which 4 recovered and 3 died after operation. In one case there was later migra-

tion with recovery; one died without intervention.

In 1899 Loison collected 14 cases of foreign bodies in the heart. In all these cases, with one exception, death followed rapidly. Judging from the number of cases which show after a long interval that the heart can tolerate the presence of a foreign body, the author shares the opinion of Delbet and Walter that in such cases abstention from operation should be the rule.

W. A. BRENNAN.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Roedelius, E.: The Postoperative Treatment of Diffuse Peritonitis. *Deutsche med. Wochenschr.*, 1917, 43a, No. 12.

The author thinks that no surgical disease calls for such skillful and prudent treatment as diffuse peritonitis, especially postoperative. He gives a detailed description of the various measures observed in his practice, which in general are an elaboration of the fundamental principles of the surgical treatment of peritonitis, namely, occlusion of the source of infection, emptying of existing pus, and providing an outlet for that which forms. The further treatment apart from the wound consists in the prevention of toxic weakening of the heart and of pulmonary complications and the dangers which threaten the gastro-intestinal tract.

Among the various means used by Roedelius may be mentioned lavage according to Rehn's method, systematic intravenous infusion of saline solution during operation, adding adrenalin or digitalin. After operation the patient is wrapped in warm coverings; nothing is given by mouth during the first fifteen hours; then cold tea, not food, is given every half hour; sufficient nourishment is introduced subcutaneously, intravenously or per rectum, so as to obviate vomiting; catheterization is done after twelve or eighteen hours if the patient has not urinated spontaneously; morphine combined with atropine is used during the early days when necessary.

The author describes his method of draining the wound; he has never seen visceral prolapse. He sees no advantage in the so-called open treatment of wounds. When the patient is able to stand, a flannel band is fixed around the abdomen. Such a bandage does not prevent hernia, but the author has not generally found that they occur. But in any case he does not operate upon a postoperative hernia till from nine to twelve months have passed. Other procedures adopted by the author are abdominal massage, application of heat to the abdomen, rectal glycerine injections, etc.

W. A. BRENNAN.

Vargas, M.: Peri-Umbilical Cutaneous Agnesia; Appendicectomy Twelve Hours After Birth; Recovery (Agnesia cutanea periumbilical; apendicectomia practicada doce horas despues del nacimiento, curacion). *Siglo med.*, Madrid, 1917, lxxv, 870.

The infant reported showed a malformation described by Ballantyne as gastroterata or gastro-schisis, in which the abdominal wall is lacking and the viscera contained in the cavity herniate. The umbilical and peri-umbilical regions were covered, not by skin as normally, but by a whitish gelatinous substance identical with that forming the umbilical cord. There was no other malformation.

The infant was brought to the author's clinic twelve hours after birth. Vargas proceeded to operate immediately after making sure of hæmostasis in the umbilical cord. He attempted to draw the skin edges together over the defect by sutures without disturbing the gelatinous covering, but after tying several sutures a rupture occurred and the intestinal organs herniated. The author had much difficulty in reducing them and was obliged to cut his previous stitches. The herniated intestine revealed the appendix 3 cm. long; in accordance with his usual rule to remove a presenting appendix, appendicectomy was done and the stump invaginated. The author then replaced the organs in the cavity, cut away the gelatinous abdominal covering and proceeded to suture. The peritoneum was first sutured, then the muscular and cutaneous coats drawn together, leaving a cicatrix 7 cm. long. The operation was performed under chloroform and ether narcosis. After ten days the child was in normal condition.

The author gives a historical sketch of congenital malformation of this type. Ballantyne mentions only 16, but the author has himself seen 5, of which he gives short descriptions. These include the present case. One other case in which he operated resulted successfully, although the child succumbed later to bronchopneumonia. The only treatment is immediate operation. Kocher has published a list of 24 operated cases with recovery.

The author remarks that this is the only reported

case of a successful appendectomy in an infant so young. Hallet has published a list of 58 cases in which infants were operated upon within thirty-six hours of birth, 15 deaths resulting.

W. A. BRENNAN.

Veau: Hernia and Appendicitis in the Child (*Hernies et appendicite chez l'enfant*). *Bull. m'ed.*, Par., 1917, xxviii, 492.

Veau has found so many cases of concomitant appendicitis in children with inguinal hernia that he now systematically examines the appendix in such cases. Where both are found to co-exist, the question arises as to what operative technique ought to be followed.

In 30 cases Veau did the double operation and in 12 he removed the appendix through the hernial incision. This latter method has inconveniences, as the appendix is difficult to reach. Veau has abandoned it except in children above four years old, because the appendix is then easily reached and removed.

In many of his cases Veau found adhesions between the appendix and the herniated intestinal loop.

W. A. BRENNAN.

Murray, L. M., and Morgan, J. D.: Diaphragmatic Hernia; with Report of a Case of the So-Called Acquired Condition. *Lancet*, Lond., 1917, cxciii, 857.

The case reported is of a Canadian private serving in the British army, who was completely buried by the caving in of a trench, following the explosion of a shell. When he was dug out, he complained of severe pain which was referred to the region of the eighth and ninth vertebrae. The diagnosis of hemothorax was made.

Examination, however, revealed the following signs and symptoms which led to the diagnosis of diaphragmatic hernia. Sudden exertion caused marked dyspnoea; no symptoms were manifested when he was quiet. On percussion of the left lung a dull tympany was elicited, the type differing with various examinations. On auscultation of the same lung in front, below the third rib, a metallic tinkling was heard, a sign which first led the examiner to suspect the presence of the stomach in the left chest. The coin test was present. The heart examination revealed a diastolic murmur at the second right costal cartilage. The intensity of the murmur varied with the position of the patient and also varied on different days. A bismuth meal and X-ray examination was made at the Canadian hospital and the diaphragmatic hernia confirmed.

In commenting upon the subject, the contributors assert that such a hernia may occur either on the right or left side. On the right side it usually consists of a knob of liver tissue. On the left side the contents are nearly always the stomach. Other organs may be carried into this hernial protrusion,

such as the intestine, pancreas, kidney, etc. On the other hand, lung tissue may make its way downward through the deficiency in the diaphragm.

Diaphragmatic herniae may be either congenital or acquired. Many of the congenital cases may show no symptoms during life, until some complications develop such as intestinal obstruction. In the acquired cases, a sudden intra-abdominal pressure will cause a rupture of the diaphragm. The symptoms complained of in almost all of the reported cases have been dyspnoea, pain, or some indefinite gastric complaint.

In conclusion, the important diagnostic symptoms are:

1. Displacement of the heart to the right.
2. A metallic tinkling heard high up in the chest, having relation to the peristaltic movements of the stomach, and not especially corresponding in time to the respiratory movement.
3. Tympany of some degree high up in the left chest.
4. Absence over the left chest of the dull note indicating fluid, or of the hyper-resonant note of pneumothorax.

M. A. BERNSTEIN.

Moschcowitz, A. V.: Epigastric Hernia Without Palpable Swelling. *Ann. Surg.*, Phila., 1917, lxxvi, 300.

The term hernia has come to mean a protrusion of a peritoneal sac. In epigastric hernia a peritoneal sac is a rarity. In most cases the bulk of the protruding mass is not omentum but a prolongation of the fat enclosed between the two peritoneal layers forming the falciform ligament of the liver.

Epigastric hernia has a distinct symptom complex; the patients usually complain of eructations, nausea, periodic attacks of pain in the epigastrium which do not bear constant relation to ingestion of food, as is the case in gastric ulcer; yet there is a striking similarity between the symptoms of the two.

Upon physical examination a mass is sometimes palpable in the median line of the abdomen between the umbilicus and the xiphoid appendix. The size, when present, varies greatly; the majority are rarely larger than a marble, while many are no larger than a small pea; and in the obese either are very difficult to palpate. Irreducibility is characteristic of epigastric hernia.

A constant physical sign is tenderness; this is so characteristic that in the very smallest herniae the diagnosis can be made by finding an extremely tender point in the midline of the abdomen.

Moschcowitz reported two cases which he operated upon that had no palpable mass; but about two inches above the umbilicus there was a very small opening with a vessel emerging and no other protruding mass; ligation of the vessel and closure of the opening resulted in recovery.

F. P. HAMMOND.

Bengolea, A. J.: A New Technique for the Radical Treatment of Umbilical Hernia in the Adult (*Subire una nueva técnica para la cura radical de las hernias umbilicales en el adulto*). *Rev. Asoc. méd. argent.*, Buenos Aires, 1917, LXVII, 409.

Bengolea's treatment of umbilical hernia in the adult is as follows:

1. Incision of the skin and subcutaneous tissues. The incision is transverse, being modified by a curved or double crescentic cut when it is desired to preserve the umbilical cicatrix.

2. Isolation of the sac and closure of the hernial orifice. When there are no intestinal or other adhesions, an extraperitoneal operation is preferred, isolating the sac and closing the hernial orifice with separate non-perforating sutures. When the orifice is large, the sac voluminous and complicated by adhesions, the sac is resected and the orifice closed transversely by sutures in one plane.

3. Utilization of the anterior sheath of the rectus. An elliptical-shaped piece of the anterior rectus sheath is next incised around the hernial orifice, varying in size according to the needs of the case. The outer edges of this are then freed and turned over so as to overlap the hernial orifice, and the edges are united by continuous sutures. This flap gives a reinforcement to the closed hernial orifice. Then the remaining two cut edges of the rectus sheaths are brought together and sutured over the previous sutured layers, giving further reinforcement to the original orifice.

The author has treated ten cases successfully by this technique. W. A. BRENNAN.

GASTRO-INTESTINAL TRACT

Mandel, M., and Gibson, W. S.: Clinical Manifestations and Treatment of Gas Poisoning. *J. Am. M. Ass.*, 1917, LXIX, 1970.

The authors discuss the symptomatology and treatment of poisoning by the German "mustard gas."

The symptoms appear between four and sixteen hours after exposure, being ushered in by epigastric pain and vomiting. Later there is a severe conjunctivitis and a persistent cough that is paroxysmal in character and worse at night. The respiratory tract suffers from an irritative, non-febrile inflammation. The exposed parts of the body show burns which, in some instances, are of the second degree.

Bronchopneumonia is the most common complication and sometimes ends fatally from a superimposed pulmonary edema not of cardiac origin.

In the treatment, the victim should be provided with dry clothes and quarters as soon as possible, as the gas decomposes on exposure to moisture; the symptoms result from the action of the decomposition products. In the severe cases with pulmonary edema, phlebotomy should be performed. There are no special indications in the treatment of the burns or of the conjunctivitis.

JOHN W. TURNER.

Crohn, B. B., and Reiss, J.: Studies in Fractional Estimations of Stomach Contents. *Am. J. M. Sc.*, 1917, CIV, 857.

In the following studies the authors have attempted to apply the method of fractional estimation of gastric contents to patients suffering from abdominal symptoms and to ascertain to what extent and in what degree pathological processes and abnormal stimuli alter the cycle of digestion, the emptying time of the stomach, the factor of duodenal regurgitation, etc.

Their studies are based upon over 200 curves representing all phases and varieties of abdominal disease. In a large percentage of cases, the clinical diagnosis was confirmed by operation. Throughout, the attempt has been made conscientiously to consider only cases in which the symptoms have been clear-cut and definitely indicative of pathological conditions.

The technique employed has been to require the patient to swallow the Rehfuess tube at 8 a.m., all other food or drink having been proscribed since the evening meal of the previous day. Retching is avoided to the greatest possible degree. The stomach is aspirated in several positions until no further material is obtainable, the amount withdrawn from the fasting stomach varying from nothing to 140 ccm. It rarely happens that nothing is withdrawn. The fasting contents were usually clear, watery, or slightly turbid in appearance. In about one-quarter of the cases bile was present in some amounts, indicating a patent pylorus.

The amounts recovered in this series were as follows: gastric neuroses, 2 to 60 ccm., averaging 31 ccm.; gastric or duodenal ulcer, 20 to 140 ccm., averaging 54 ccm.; cases of chronic appendicitis, 30 ccm. Marked subacidity or achylia cases were either empty or showed at a maximum 10 to 25 ccm.; functional hypersecretion, 50 to 70 ccm. Crohn and Reiss were unable at any time to duplicate the large amounts found by Rehfuess and his co-workers in normal males, or of Fowler and Zentmire in normal or approximately normal females.

Every specimen was titrated for free and total acid, and the resulting amount expressed in cubic centimeters of decinormal sodium hydrate per 100 ccm. of stomach contents. A curve based on the result was then plotted. The appearance of bile in the aspirated fractions was carefully noted. The emptying time of the organ was estimated by the disappearance of the starch reaction as determined by the addition of tincture of iodine in excess of each tube. The presence of mucus was carefully noted; tests were made for rennin and pepsin in cases of anacidity, and the Wolff-Jung-hans test performed in cases suspected of carcinoma.

The pure gastric neuroses and the so-called normal cases showed free acid at the beginning of the test; maximum total acidity was reached at about one hour. The stomach emptied itself usually in

two or two and one-half hours. No relationship could be traced between the degree of biliary regurgitation and the fall of acidity toward the end of digestion. The presence of mucus has not been constantly proportionate to the fluctuations of acidity or to the fall of acidity at the end of digestion. In cases free from organic or secretory derangements, the height of digestion took place at one hour.

In cases of hyperchlorhydria, the total acidity rose rapidly and higher than in normal cases, although the emptying took place in the usual time. The hyperacidity ranged between 80 and 110 per cent, and often reached 130 and 140 per cent or exceptionally higher.

In cases of hypersecretion, the secretion of gastric juice may continue for hours after the normal period of digestion. In cases of anacidity there was a lack of free hydrochloric acid throughout, though the total acid may have risen to 20 or 30 per cent at some time of the digestion. Ferment strengths were maintained, fasting contents were usually absent or of minimal quantity, and the stomach emptied itself within two hours. In the achylia cases free acid was consistently absent throughout; total acid fluctuated between 8 and 10, or at most 14 per cent. The emptying time was shortened to one and one-half or one and three-fourths hours; ferments were absent.

The authors believe that ulcer cases are associated with a curve of acidity that rises rapidly and is sustained, if not throughout the cycle of digestion, at least to within a short time of its end. A steady prolonged rise and sustained plateau are seen consistently in ulcer cases. Acidity, if it falls at all, does so just before the final emptying of the stomach. A delayed motility was frequently a factor and indicated pyloric involvement. The regurgitation of bile is commonly absent or, when present, takes place at the very last phase of the digestion. The presence of mucus was not associated with ulcer. Blood was absent throughout. Very little trauma was associated with this method of the test meal, and the presence of blood had therefore all the more significance. The highest acidity in these cases took place in from one and three-fourths to three hours after giving the test breakfast. Cholelithiasis and chronic appendicitis curves have not been differentiated by the authors from those of ulcer cases.

In posterior gastro-enterostomy cases, the curves were characterized by a drop in the acidity which took place at the end of the first hour. This drop was associated with regurgitation of intestinal contents and was followed by a secondary rise of acid. The regurgitation of intestinal contents once begun continued to the end of digestion.

In cases of cancer, the curves are those of marked subacidity and occasionally of anacidity. The gastric ferments rennin and pepsin were retained in all the cases. Blood was a very common occurrence toward the end of digestion. Mucus was frequently

abundant. The authors were unable to draw diagnostic conclusions from estimates of soluble albumin performed by the Wolff-Junghans method.

They conclude that the following information may be gained from the estimation of stomach contents by the utilization of this method. (1) regarding fasting contents, the amount, presence of food residue, presence of regurgitated bile, mucus, or blood; (2) the type of secretory activity as regards free and total acid, i.e., the acid curve; (3) the duration of secretory activity, whether ceasing with the exit of the food or maintained as a hypersecretion thereafter; (4) the time of emptying of the stomach, i.e., its motility; (5) the presence of mucus and time of occurrence; (6) the presence of bile as indicative of pyloric relaxation and duodenal regurgitation.

While this method does not give a finished diagnosis, it gives a number of facts which, when properly interpreted, may be recognized and indicated as functional disturbance of the stomach associated with a particular disease. A disadvantage of the method is the time required for its completion.

E. C. ROBITSEK.

Balfour, D. C.: Restoration of Gastro-Intestinal Continuity by Means of Anticolic Gastro-jejunostomy Following Partial Gastrectomy for Cancer of the Pyloric End of the Stomach.

Surg., Gynec. & Obst., 1917, xxv, 473.

The resection is carried out in the ordinary manner with especial attention to such important points as the wide removal of gland-bearing tissue, the avoidance of injury to the middle colic blood supply of the transverse colon, the resection made well beyond the cancer limits, the cauterization of all cut mucous surfaces to prevent cancer-cell transplantation, and the secure inversion and burial of the duodenal stump. The operative field is inspected and carefully isolated by fresh packs. The second stage is carried out as follows:

The first loop of jejunum is procured and a point about 14 to 18 inches from the duodenojejunal angle is marked. The jejunum is then carried up in front of the transverse colon and omentum and a segment of suitable size is chosen at the point already marked. This section of jejunum is lightly grasped with rubber-covered forceps and directed so that the proximal end of the loop will be approximated to the lesser curvature of the stomach. A series of interrupted silk sutures in the serosa is used for the first line posteriorly, beginning at the greater curvature. All these sutures are placed before any are tied, and the ends of the top and bottom sutures may be conveniently left as guides.

The first suture line is about half an inch below the clamp on the cut end of the stomach, and on the side of the jejunum about three-fourths of an inch from the summit of the loop. The jejunum is now incised on the line and the crushing clamp removed from the stomach. Any actively bleeding vessels are ligated. The posterior row of the anastomosis

uniting the posterior wall of the stomach to the inner cut edge of the jejunum is of chromic catgut. The stitches on the gastric side should be taken after the edge which has been crushed by the clamp has been trimmed with the scissors. A second row of finer catgut may be used to advantage in the posterior line. The first chromic catgut suture is continued in front in the usual way to complete the closure. An interrupted silk suture line similar to that used posteriorly is placed anteriorly, particular care being taken to reinforce the angle of anastomosis at the lesser curvature. A few interrupted silk sutures are placed where necessary further to protect the anterior suture line and the suture at the lesser curvature, the stump of gastrohepatic omentum which contains the ligated gastric artery being utilized as a support to the gastrojejunal angle at this point.

That the operation is of less risk than other methods is very definitely shown by the operative mortality statistics. From January, 1907, to August 16, 1917, in 318 resections by the Billroth No. 2 method, there was an operative mortality of 13.2 per cent; in 104 cases by the Polya method, a mortality of 14.4 per cent, while in 38 cases with the method described the mortality was only 5.2 per cent. This comparison of operative mortality is quite fair inasmuch as the operations were done by the same surgeons in the same clinic with similar surgical indications. EDWARD L. CORNELL.

Cole, L. G.: *The X-Ray in Peptic Ulcer*. *N. Y. St. J. Med.*, 1917, xvii, 542.

By peptic ulcer the author means not only ulcer in the stomach proper but also in the first or ascending portion of the duodenum. Morphologically the entire thickness of the wall is involved either by ulceration or surrounding induration, and there may be in addition cicatricial contraction or adhesions to adjoining viscera. Gross deformities, such as are produced by advanced lesions, are so easily recognizable by the roentgen method that mere mention is made of them.

Regarding the small round ulcer with the superficial crater in its early stage, the author maintains that it should be just as accurately detected and diagnosed as the gross lesion. To quote him: "The small early ulcer can be diagnosed with as great a degree of accuracy by serial roentgenography as a fracture of the long bones can be diagnosed in a plain roentgenogram." He states that the carcinomatous ulcer can be diagnosed just as accurately as the other types.

Diagnoses made on the basis of symptoms and laboratory findings alone can hardly be used to base statistics upon relative to the results of treatment. These should be founded on absolute facts as revealed by the roentgen ray or surgery, and ultimate results checked up by re-examination. This method is not used by some surgeons and most gastro-enterologists to the extent it deserves to be.

ADOLPH HARTUNG.

Deaver, J. B.: *Peptic Ulcer*. *N. Y. St. J. Med.*, 1917, xvii, 529.

Peptic ulcer is an ulcer of that portion of the gastro-intestinal tract in which gastric juice is normally found. Peptic ulcers may be acute or chronic and either type may be present without giving rise to symptoms, but are always a menace since they may give as much trouble as when symptoms are constantly present.

There is no parallelism between the gross character of ulcer and the symptoms to which it gives rise, as the symptoms in respect to origin fall in four groups, as follows: (1) symptoms due to infection; (2) symptoms due to disturbed function; (3) symptoms due to hæmorrhage; (4) symptoms due to perforation.

Deaver believes in the large majority of cases ulcer is due to secondary infection, most frequently from the appendix or gall-bladder. Because of this he examines these organs, likewise the pancreas, and if their appearance is suspicious, he removes the appendix and if necessary the gall-bladder at operation.

The types of ulcer most frequently observed by the surgeon are the chronic non-perforating and the acute perforating. Of the latter Deaver has had about 12 to 20 per cent. The frequency of chronic ulcer has been three in the duodenum to one in the stomach.

For diagnosis he relies on careful history, periodicity of attacks with remissions, relief on taking food, and as less characteristic, gas eructations, nausea, vomiting and hæmorrhage. Of the laboratory methods he favors the stomach tube most. He uses both the test meal and motor meal analysis. He also outlines the stomach by inflation with air and by filling with water.

Positive X-ray findings are of value; negative findings are not so reliable.

Differentiating peptic ulcer from appendicitis, in appendicitis there is discomfort even during periods of remission from acute pain; the pain is not so severe and radiates downward. There is tenderness evidenced on deep palpation over the appendix.

Differentiating it from gall-stones, the pain in gall-stones is colic-like, sudden in its onset and subsidence.

The pain in chronic pancreatitis has no relation to the food intake.

The time relation of pain to the taking of food is of importance in differentiating stomach and duodenal ulcer.

The operation of choice is excision of the ulcer, followed by posterior gastro-enterostomy only when the mechanism of the stomach has been left defective by excision.

Posterior gastro-enterostomy alone is only of value when the ulcer is situated in the pylorus and causes obstruction; and in this case Deaver favors pylorotomy.

It has been his practice in every case of operation

for peptic ulcer to remove the appendix and to examine the gall-bladder and remove it if any signs of pathology are presented. I. E. BISHKOW.

Finney, J. M. T., and Friedenwald, J.: Gastric Polyposis. *Am. J. M. Sc.*, 1917, cliv, 683.

The author reports two cases of gastric polyposis. The first case presented symptoms of anæmia, absence of hydrochloric acid in the gastric contents, a large filling defect on the greater curvature near the pylorus, and blood in the stool and stomach content. A diagnosis was made of gastric carcinoma, which proved on operation to be a papilladenoma with malignant degeneration. Excision of this was followed by a continuance of the anæmia and melæna. A second operation revealed a mass posterior to the duodenum, so definitely malignant and adherent that removal was inadvisable.

The second case presented definite findings, on test meal and roentgen ray examination, of annular pyloric carcinoma with retention. Operation revealed a papillomatous pyloric mass. Excision of this region and posterior gastro-enterostomy resulted in recovery.

Chronic gastritis is cited as the chief factor in the production of gastric papilladenomata. Males over forty are predisposed. They usually are pyloric, and may be pedunculated or broad-based. Their gross and histologic formation depends upon the portion of the glandular area that is rendered hypertrophic or hyperplastic.

The microscopic picture is given in detail.

These polypi are usually benign, and may be devoid of symptoms for a long time, or may have severe symptoms.

The finding of polypi on lavage, the characteristic picture by X-ray, and the constant presence of free blood in the gastric content, combined with achylia gastrica, are important diagnostic factors.

V. E. DUDMAN.

Triollet, L.: The Treatment of Gastro-Intestinal Hæmorrhages of the Newborn (Du traitement des hémorragies gastro-intestinales du nouveau-né). *Arch. mens. d'obst. et de gynéc.*, Par., 1917, v, 354.

The author makes a subcutaneous injection in the scapular region of 20 ccm. of sterilized gelatinous serum. This is renewed each day that hæmorrhage occurs. One to two grains of calcium chloride is given each twenty-four hours. This quantity is made into a potion of 1:50 and administered every two hours.

The treatment is continued while the hæmorrhage persists, but the calcium chloride may be continued one or two days longer. Alimentation is restricted during the crises, the thirst only being relieved. The infant is kept warm in a room at constant temperature. Six cases treated at the Tarnier Clinic in this way by the author have given permanent recoveries. Other methods have been abandoned. Sterilization prevents the complications which were formerly observed in the use of gelatinous serum.

W. A. BRENNAN.

Saphir, J. F.: Quinine and Urea Hydrochloride. *N. Y. M. J.*, 1917, cxi, 1161.

Local anæsthesia is desirable in rectal ailments because of the fact that many needed operations would thus be performed that would be deferred if general anæsthesia were suggested. This form of anæsthesia is indicated particularly in: (1) patients suffering from pulmonary, nephritic, or cardiac diseases; (2) patients who are not in good condition because of neglect of a devitalizing operative condition; (3) patients to whom time is an important factor because of business or social demands; and (4) patients who fear to take a general anæsthetic.

Many substances have been used as local anæsthetics, including cocaine in solutions of varying strength, beta-eucaine, stovaine, novocaine, alpin, chloretone, and even salt solution, and sterile water. Each of the above has certain objectionable features, the one in common being the peculiar toxicity that is evident when any of these local anæsthetics are used in the rectal region. This feature is avoided by the use of quinine and urea hydrochloride. The author gives specific directions as to the preparation of this substance.

The advantages of quinine and urea hydrochloride as a local anæsthetic are: (1) its non-toxicity when given in unlimited doses; (2) its prolonged anæsthetic effect, lasting from three days to two weeks, dependent upon the strength of solution used; and (3) the fact that a fibrinous exudate outpours in the tissues immediately following injection, this exudate serving as a hæmostatic agent. This last action lasts from three to ten days, which is a very apparent advantage over the transient hæmostatic action of adrenalin.

The chief objection advanced against the use of this local anæsthetic, namely, delayed union or sloughing, has been occasioned by use of too strong a solution. This is obviated by using 0.125 per cent to 0.5 per cent, and no higher. However, in certain conditions, as in ulcerative hæmorrhoids, a high per cent solution is desirable because of increased hæmostatic action.

The author recommends a syringe of his own device for this type of anæsthesia. He advises against elaborate local preparation or previous catharsis, maintaining that much of the postoperative pain following operative procedures in this region results from purging and from too violent sphincter dilatation, or rough drainage.

He warns against the use of local anæsthesia unless the operator has accurate knowledge of what is to be done.

For thrombotic hæmorrhoids, injection of the clot-bearing area and complete excision can be accomplished without inconvenience to the patient.

External hæmorrhoids are treated in a similar manner, no suture being necessary.

This anæsthetic can be used in correcting internal hæmorrhoids, a 0.5 per cent solution being used and the tissues thoroughly injected before

being handled. By this means, dilatation of the sphincter can be avoided, and the patient need not be confined to bed. It is also unnecessary to administer opium, as the bowels are permitted to move the following day.

The author cautions against ligating several hemorrhoids in the same plane because of danger of stricture, and condemns the use of anal plugs in the form of gauze drains. He does not favor the use of the clamp and cautery, nor the Whitehead operation.

For relief of fissura ani, as opposed to division or stretching of the sphincter, he advises the use of a local anæsthetic of a 0.5 per cent solution of quinine-urea hydrochloride, and division of the sphincter.

He summarizes the advantages of quinine-urea as follows: (1) the lack of pain at time of operation; (2) the duration of three to ten days following operation; (3) the lack of toxic effects; (4) its hæmostatic action; (5) its solubility in water; (6) the fact that a weak solution can be used to promote moderate fibrinous exudate for hæmostasis; and that (7) stronger solutions can be utilized in areas where sloughing is the desired result.

V. E. DUDMAN.

Defontaine, L.: A Method of Gastrostomy (Un procédé de gastrostomie). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1982.

Defontaine's method of gastrostomy comprises: 1. A median supra-umbilical laparotomy for exploration of the stomach.

2. Fixation and opening of the stomach wall, bringing it to the outside by a forceps through the abdominal wall in the neighborhood of the rectus muscle.

The supra-umbilical incision permits approach to the best point in the stomach wall, nearest to the cardia and furthest from a neoplasm, if such exist, and no harmful dragging is necessary. It also sustains the abdominal wall while the forceps traverses the rectus and perforates the peritoneum; it protects the viscera against any wound which the forceps might cause when it penetrates the abdominal cavity.

A small incision is made in the abdominal wall in the vicinity of the rectus on the left side at a point corresponding to that point of the stomach which is to be seized; the anterior sheath of the rectus is slit by the bistoury. Through this orifice a Terrier or a Delagenière forceps is passed closed, and pushed through the muscle with the aid of the finger, and then into the peritoneum. The forceps is then opened and the stomach wall is seized in its entire thickness. It is slowly drawn to the exterior through the abdominal wall orifice.

Four stitches fix the gastric muscular serosa to the musculo-aponeurotic wall of the abdomen; then with the gastric cavity opened, four more stitches fix the whole thickness of the stomach wall, including the mucosa, to the skin. The abdominal incision is then closed.

As the fibers of the rectus muscle have neither been dissected nor dragged, but only separated at a limited point, they help in rendering the opening in the stomach patent. Because the abdominal wall has not been divided in the vicinity of the new orifice, it need not be closed by sutures and the chance of disunion is avoided.

The author used this method in a child of three and one-half years following the swallowing of some acid two months before. The opening remained patent.

W. A. BRUSSAS.

Carter, H. S.: The Medical Aspect of Gastro-Enterostomy. *Am. J. M. Sc.*, 1917, cliv, 851.

In the discussion of gastro-enterostomy, its relation to chronic gastric or duodenal ulcer alone is under consideration.

The author believes that these cases are medical before they are surgical, because they should all be given the benefit of a thorough, painstaking medical cure, or even two medical cures, before surgery is considered. The reason for this insistence is because a fair proportion of cases do get permanently well on this plan of treatment and are spared the operative risks, as Carter attempts to show by statistics.

The indications for operation, provided that medical cure has failed or is inadvisable, are: (1) chronicity of the symptoms in spite of medical treatment; (2) repeated hæmorrhage or very severe hæmorrhage; (3) pyloric stenosis.

The result of gastro-enterostomy on the symptoms as far as the immediate effect is concerned is usually a happy one after the postoperative discomfort is over; the changes in secretions following this operation are often insignificant, and in general, the author claims, it may be said that the acid values shown by gastric analysis are all somewhat lower, but the case that was hyperacid before operation is apt to remain so following operation, although the acid values are less. The cases with normal pre-operative acidity are seen to have the acidity more or less reduced, but often show little change, while other cases promptly show an achylia. Certain cases remain with a hypersecretion, while in others it occurs for the first time following operation.

Operations on the stomach with a normal secretion and motility often result in stasis or hypersecretion or both and operative treatment on a stomach with delayed motility and hypersecretion usually brings motility to normal and lowers acidity. The modification of the symptoms and secretion, Carter believes, is undoubtedly due to: (1) the relief of pylorospasm, which follows the operation; (2) the inflowing of alkaline jejunal contents; (3) lessened emptying time of the stomach provided the pylorus has not been occluded. In generally weak patients, there will be atony and delayed emptying. If vigor is promptly restored and the pylorus is patent, gastric motility is better and the emptying time shorter than normal. The character of the stools is apt to be unduly copious in comparison

with the meals eaten, and this is probably due to poor fat absorption.

The remote result of gastro-enterostomy in regard to the symptoms is the permanent relief of these, provided no complication exists and the ulcer heals. The secretions gradually become normal, showing lower acid values than before or immediately following operation. The late results in motility are the same as the early results when there is no atony.

When one looks at the surgical statistics regarding the end-results of gastro-enterostomy, it will be seen that in comparison with the medical result, the percentage of cures is higher, apparently increasingly so, as the cases are properly selected, the operation performed by a competent surgeon, and the patient judiciously cared for and fed after the operation. Up to the present time most surgeons have been extremely careless in the matter of diet. After operation the ulcer is still present and potent for evil; it is also possible to produce an ulcer on the jejunal wall opposite the new stoma by constant trauma of rough food plus a hyperacid gastric juice.

All cases of gastro-enterostomy should be given a regular ulcer diet, giving the old ulcer the most favorable opportunity to heal and preventing food irritation elsewhere.

E. C. ROBITSHEK.

Mayo, C. H.: Jejunostomy; Its Indications and Methods. *J. Lancet*, 1917, xxxvii, 793.

The author advises jejunostomy for the relief of obstruction and for purposes of nutrition. In the first group are cases of obstruction following operation and cases of acute obstruction from some unknown cause. In the second group are those cases of widespread cancer of the stomach obstructing the cardia and leaving little room for gastrostomy, cases of extensive laceration of a cancer of the stomach made accidentally during exploration, and extreme cases of nervous vomiting of girls from eighteen to twenty-five years of age.

The operation for purposes of nutrition is performed through a midline or left lateral incision; for the relief of obstruction it is best to re-open the former incision unless it is infected. In cases of obstruction the operation should be performed as soon as the evening of the third day or on the fourth day. If there is no general peritonitis and the obstructive condition is recognized early, the operator may explore the region of the primary operation, separating bands of adhesions or kinks and relieving the obstruction.

If jejunostomy is considered necessary, a No. 10 English catheter is inserted a few inches into the lining of the selected gut and is fixed to the bowel by a purse-string suture of chromic catgut or silk. The catheter is then depressed into the wall of the bowel which is sutured over it for an inch and a half. It is passed through a perforation in the omentum and brought out through the incision, sutures being passed through the peritoneum, the omentum, and the intestine on each side of the tube to hold it in position.

JOHN W. TURNER.

Ruggles, H. E.: Right-Sided Position of the Stomach in Inflammatory Conditions in the Ileocaecal Region. *Am. J. Roentgenol.*, 1917, iv, 577.

The author's attention having been called to the right-sided position of the stomach in a case of extensive adhesions involving the ascending colon and omentum, he subsequently noted a similar displacement in several cases where operation failed to discover sufficient evidence to account for it. In a series of 24 cases, 12 of which were operated upon and found to have adhesions or disease in the ileocaecal region, 6 had their incisura angularis shifted well over to the right side. In the other 12 cases, 6 of them individuals in whom operation revealed no ileocaecal adhesions and the others being free from clinical and roentgenological evidence of appendiceal disease, the incisura was to the left of the median line.

In view of these findings, the author believes that where right-sided displacement of the stomach is noted, the ileocaecal region should be subjected to an unusually thorough examination for other evidence of pathology.

ADOLPH HARTUNG.

Beekman, F., Smith, M. K., and Everingham, S.: Acute Appendicitis; an Analysis of 500 Cases. *Am. J. M. Sc.*, 1917, cliv, 490.

The authors base their paper on a study of the cases of acute appendicitis admitted to Bellevue Hospital during the years 1911 to 1916 on the services of different surgeons.

It was their experience that if the gross appearance of the appendix was not evidently that of acute disease, there was seldom other sufficient evidence to so regard it. They quote Moschcowitz's statement that in 90 per cent of the cases the diagnosis of a present or previous appendicitis may be easily recognized by the naked eye. They report a mortality of 6.8 per cent. The mortality is reduced to only 1 per cent if operation is done within the first twenty-four hours. By the end of the second day the mortality is quadrupled, and by the end of the third day the mortality is far above the general average.

The lesson to be drawn from this is that in the presence of virulent infections and low resistance, a delay of seventy-two hours seriously compromises the hope of recovery. Operations done later than twenty-four hours after the onset of symptoms cannot be considered early. They found that twice as many died who were operated upon the third day after the onset of symptoms as on any other day of the illness. Another factor influencing the mortality is the age of the patient; the very young and the elderly often succumb. In their series the mortality of those under ten years and over fifty is 23 per cent, as opposed to a mortality of 4.7 per cent for those between.

They believe the mortality figure may be greatly improved by making an early diagnosis followed by immediate operation. Death was ascribed to intra-

abdominal suppuration in 82 per cent of their 34 fatal cases, of which 62 per cent was due to diffuse peritonitis. A temperature over 104° is usually indicative of diffuse peritonitis. Abscesses were found in 21 per cent. Faecal fistula and postoperative pneumonia were the most common sequelae, the former in 5 per cent, the latter in 2.5 per cent of the cases.

In conclusion they emphasize the fact that operation should be performed as soon as the diagnosis of appendicitis is made, because the shorter the period between the onset of the disease and surgical interference, the better the prognosis, the death rate being lower, few complications and sequelae developing, and the stay in the hospital shortened.

G. W. HODGKINS.

Rouchier: Appendicitis in the War (*Appendicite à la guerre*). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1846.

Rouchier finds that appendicitis is more frequent in the army than in civil life. This is probably due to fatigue and exposure to wet and cold, which renders a latent infection acute by lowering the resistance or it may even give origin to primary acute appendicitis. The crises are particularly severe but it happens that men who are inured to hardships endure these crises often without seeking aid, and such cases arrive at hospitals with fully established diffuse peritonitis and perforated appendices.

Rouchier thinks that when the diagnosis of appendicitis is made, the patient should at once be sent to a surgical center where he can be operated upon if necessary. The operation should be carried out at the surgical post within at least thirty-six hours, and if this interval is exceeded Rouchier thinks that operation should be delayed until after the acute attack.

When the diagnosis is made early, the patient can generally be transported so as to arrive at the surgical station in sufficient time to benefit by an early operation.

The important points therefore are early diagnosis and immediate transport, even in cases where there are only suspicious symptoms. W. A. BRENNAN.

Baird, R. W., and Kindley, G. C.: Hirschsprung's Disease; Report of a Case. *South. M. J.*, 1917, 2, 846.

The patient was a girl six years of age with a negative family and previous medical history. The illness began with pain in the abdomen followed by diarrhoea, about two and one-half years before she was seen. These attacks occurred every two or three weeks for about one year. The appetite was fairly good, but as the disease progressed there was nausea in the morning. She slept well at night but was drowsy during the day. Diarrhoea alternated with constipation. The urine was scanty.

At physical examination, the patient, though very pale, showed no emaciation. Her face was edema-

tous and the skin rough and dry. There was erythema of the back of the forearms and over much of the body. The tongue was badly coated, the tonsils large and cryptic, and there was a soft systolic murmur at the base of the heart with some cardiac dilatation. The spleen was not palpable and there was no glandular enlargement. The abdomen was distended and tympanitic. A mass the size of a small orange was palpable at the umbilical area, while a larger mass extended from the right hypochondrium down to the pelvis and then upward to the left hypochondrium.

Blood count showed 1,315,000 reds, 8,600 whites; haemoglobin 10 per cent; polymorphonuclears 68 per cent; color index 0.4 per cent; with one normoblast, slight poecilocytosis, marked anisocytosis and some polychromatophilia. The stool contained occult blood; otherwise it was negative.

X-ray examination following a barium meal confirmed the diagnosis of megacolon. The patient died the third day after admission. No necropsy was permitted. CARL R. STEINKE.

Mayo, W. J.: A Study of the Rectosigmoid. *Surg., Gynec. & Obst.*, 1917, xxv, 616.

The rectosigmoid is the narrowest part of the large intestine. It consists of 3½ inches of the intestinal tract, and includes the terminal 2 inches of the sigmoid and the proximal 1½ inches of the rectum. It has a definite mechanism for the purpose of retarding the faecal current and preventing continuous progress of the intestinal contents into the rectum. The rectum proper begins at the middle of the third sacral vertebra and, anatomically speaking, ends at the level of the apex of the prostate in the male and at the upper level of the perineal body in the female, sites which mark the beginning of the so-called second portion of the rectum, or, more correctly, the anal canal.

The anal canal has its origin in the proctodaeum or skin infold. It is lined with pavement epithelium, has no mucous glands, and is in no way a part of the rectum, but is rather a retentive mechanism extraordinarily well adapted to temporary rectal retention. The anal canal is about 3 cm. in length, and passes upward and forward at such an angle in relation to the musculature of the rectum as to relieve the strain on the sphincter muscles.

The rectum is a single organ averaging 11 cm. in length, with a protective sigmoid mechanism above and the sphincter apparatus of the anal canal below.

This interpretation of the anatomy of the rectum is in harmony with its embryologic origin. The rectum proper is derived from the cloaca, a highly differentiated part of the hind gut from which also the bladder is derived. Definite anatomic changes are to be found in the epithelial layers of the mucous membrane at the rectosigmoid juncture and possibly a tissue weakness worthy of note.

The more or less circular folds of the mucous membrane of the sigmoid in this terminal portion

take on a longitudinal arrangement with much the appearance of the columns of Morgagni and the rectal sinuses, and end in a rudimentary sphincter apparatus at the very beginning of the rectum. This hint of a sigmoid sphincter at the rectosigmoid union forms a well-marked resisting constriction to the readily dilatable sigmoid above and the rectum below.

This circular band at the termination of the sigmoid contains considerable non-striated muscle fiber and was found in eighty per cent of 46 cases, and in 2 of the 46 it amounted to a definite narrowing which reduced the caliber to a considerable extent.

The impression is gained that ordinarily the rectosigmoid is an arrangement for retention of contents in the sigmoid proper, and that under certain circumstances the controlling mechanism may subject the parts to undue stress.

The terminal sigmoid, as held by its mesentery, has considerable play, and curves from its rectal attachment. The longitudinal muscle-bands are well developed and by spreading out grasp the entire rectum. It is probable that contraction of these bands from the fixed point of the rectum under proper stimulation enables the sigmoid to straighten and pour its contents into the rectum, while under ordinary circumstances the angulation is co-effective in retention. Investigation shows that the emptying of the large intestine from the splenic flexure is accomplished largely by syphonage. The hardened head of the faecal current rests at the rectosigmoid and the syphon is established when this mass, which can be compared to the piston of a syringe, moves onward.

The difficulty of guiding tubes and instruments from the rectum into the sigmoid is due to the rectosigmoid mechanism, and ordinarily it is futile to use the so-called colonic tube, the passage of which out of sight into the rectum, where it remains coiled, leads to the supposition that it has passed into the sigmoid. Single or several polypi which are so frequently found in the ampulla of the rectum and which, on straining, are grasped in the sphincter apparatus and rendered pedunculated, have their counterpart in the single, or at most, two or three polypi, which are so often found in the terminal sigmoid and which for the same reasons have become pedunculated into the rectum. Hirschsprung's disease, or giant colon, as a rule has its origin in the rectosigmoid mechanism. Diverticulitis and other infections are frequent in this locality.

With the exception of the pyloric end of the stomach, carcinoma is to be found more frequently in this $3\frac{1}{2}$ inches than in any corresponding part of the gastro-intestinal tract. In an investigation of the last 100 specimens of cancer of the rectum and rectosigmoid removed consecutively at St. Mary's Hospital, Rochester, Minnesota, it was found that 28 were located in the rectosigmoid juncture, extending as much on the rectal as on the sigmoid side; 21 involved the juncture but extended more

on the rectal than on the sigmoid side; 14 involved the juncture but extended more on the sigmoid than on the rectal side. Thus 63 per cent involved the rectosigmoid, 30 per cent the rectum only, and 7 per cent the anal canal.

Pennington, J. R.: Anal and Rectal Fistula. *J. Am. M. Ass.*, 1917, lxxix, 1301.

The author emphasizes the importance of considering the sinuses and diverticula of the lower bowel as prominent etiological factors, from an embryological standpoint, in the causation of fistulae and abscesses. He also cites traumatic causes and pathological conditions favoring the invasion of pathogenic bacteria, which is the essential exciting factor.

The development of fistulae resolves itself into: (1) the prefistula stage; (2) the stage of infection; (3) the abscess stage; and (4) the fistula stage.

The position of the internal fistular opening is the point of chief prognostic import. Accurate determination of the cause of the tract is often difficult, though this may be solved by use of the roentgen ray.

Careful rectal hygiene is advocated as prophylactic treatment. Conservative drainage, in the abscess stage, and injection with bismuth subnitrate ointment is advanced as an abortive measure; this treatment is effective also in some cases after having reached the fistula stage.

He recommends, in particular, that in the operative treatment of fistulae the entire tract, including the surrounding pyogenic membrane, be dissected out thoroughly, and, having been assured of entire cessation of hæmorrhage, that the wound be entirely closed by suture, using catgut for the mucous membrane and sphincter, and silkworm-gut for skin and fascia.

V. E. DUDMAN.

Brav, H. A.: The Pathology, Diagnosis, and Treatment of Internal Hæmorrhoids. *N. Y. M. J.*, 1917, cxi, 1118.

Internal hæmorrhoids are varicosities of the middle and superior hæmorrhoidal veins, sometimes associated with eversion of the rectal mucous membrane. Allingham describes three varieties of internal hæmorrhoids: capillary, arterial, and venous, which the author considers the first, second and third stages respectively of hæmorrhoidal development, the venous type consisting of a mass of large dilated veins beneath the mucous membrane which has become thickened by repeated irritation, producing a large bluish tumor which protrudes during defecation.

The diagnosis of internal hæmorrhoids is apt to be confounded with cancer of the rectum, polypus, and prolapse of the rectum. The difficulty arises in the early stage of hæmorrhoidal development when there is no external evidence of internal piles and bleeding is the only symptom. The diagnosis is also more difficult when hæmorrhoids are complicated

ed by a fissure or ulcer of the rectum. An examination in a case of internal hæmorrhoids should never terminate at the evidence of hæmorrhoidal tumors, for it often happens that higher up a stricture exists which manifests no other signs of its presence except the hæmorrhoids.

The treatment of internal hæmorrhoids is generally considered under two heads, namely, palliative measures, and radical cure by operation. Permanent cures cannot be effected with palliative measures in the third stage of hæmorrhoidal development. Internal hæmorrhoids secondary to stricture of the urethra, enlarged prostate, vesical calculus, pregnancy, or neoplasm will completely disappear when these affections are cured. Constipation, the most common cause of internal hæmorrhoids, should be treated by regulation of the diet, injection of olive oil, or in obstinate cases, saline cathartics are indicated.

Hæmorrhage is most efficiently relieved by the use of astringents and cold. Hæmorrhage from a sporting vessel can be stopped by a ligature.

The injection of a moderately strong solution of carbolic acid into the center of the pile results in a hardening and diminution in the size of the hæmorrhoid. The author uses a solution consisting of one part pure carbolic acid to two parts of glycerine and two parts of water, injecting 5 to 10 drops into a hæmorrhoid.

Strangulated piles, if an operation is refused, should be treated by local application of lead water and laudanum lotion applied ice cold, which often reduces the swelling so that reduction by taxis may be accomplished.

Of the operative methods for radical cure of internal hæmorrhoids the author prefers the ligature or Salmon's operation. After the ligature has been tied, he does not cut off the pile unless it is very large, but replaces it within the bowel. He also inserts into the rectum a firm piece of rubber tubing $3\frac{1}{2}$ inches long and 1 inch in diameter, around which sterile absorbent cotton is wrapped. The tube serves to allow the escape of flatus, the possible detection of bleeding, and the passage of a catheter for the giving of enemata when necessary.

The clamp and cautery operation has won an enviable reputation and the author prefers it next to the ligature operation.

From the author's experience in the treatment of internal hæmorrhoids he has arrived at the following conclusions:

1. In the treatment it is important to determine whether the disease is primary or secondary to some affection of the pelvic organs.

2. In the first stage of hæmorrhoidal disease no treatment is indicated.

3. The true value of non-operative treatment is frequently underestimated in the second stage of hæmorrhoidal disease.

4. None but operative treatment should be resorted to in the third stage of hæmorrhoidal disease.

V. C. HUST.

LIVER, PANCREAS, AND SPLEEN

Manzone, C.: Carcinoma of the Gall-Bladder
(Sobre un caso de carcinoma de la vesícula biliar).
Semana méd., Buenos Aires, 1917, xiv, 428.

Manzone's patient was a woman of 64 years who was diagnosed and treated for cholelithiasis. Laparotomy showed a tumor involving the neck of the gall-bladder and the first part of the cystic duct. The bladder, duct, tumor and liver formed a conglomerate mass which had lost all anatomic relations. On incising the gall-bladder a large single calculus was found and easily extracted. There were no signs of superficial ulceration.

Owing to the conditions, a radical operation could not be performed and intervention was confined to cholecystostomy. The biliary colic ceased after operation, but the general state did not improve.

Although there was no histological confirmation, yet by reason of the lesions observed during operation and of the progress of the case after operation, the author believes this was a case of primary carcinoma of the gall-bladder associated with lithiasis, and that the lithiasis preceded the neoplasm.

W. A. BRENNAN.

Duemling, H. A.: Cholecystectomy Versus Cholecystotomy. *J. Indiana St. M. Ass.*, 1917, x, 466.

The author reports 10 cases of cholecystotomies and 42 cases of cholecystectomy. In this group there were 7 deaths: one each from pulmonary embolism, cholecystitis, Charcot's fever, cholangitis, cholelithiasis and two from sepsis due to gangrene.

Gall-stones have been removed for the past three hundred years in the following ways:

1. The escharotic method by which preparations were spread on the gall-bladder region until firm adhesions were formed between the parietal peritoneum and the gall-bladder.

2. The attachment of the gall-bladder to the parietal peritoneum by sutures.

3. Cystostomy: opening the gall-bladder, suturing and returning it to the abdominal cavity. Many of these cases developed peritonitis.

4. Pappert's waterproof tube drainage.

5. Removal of the gall-bladder.

6. Cholecystotomy and the use of the T-tube for drainage.

The author says that stones can be diagnosed positively only when stones have been found in the feces, or have been vomited. Stones do not constitute the disease of the gall-bladder, but are the result. The removal of a stone will not cure the disease unless something is done to remove the cause.

The following are the indications for cholecystectomy: (1) phlegmonous cholecystitis; (2) empyema of the gall-bladder; (3) chronic cholecystitis, with shrunken and thickened gall-bladder walls; (4) hydrops; (5) extensive injury of the gall-bladder; (6) carcinoma, if limited to the gall-bladder.

Mayo says that cholecystotomy and the removal of stones will cure symptoms of mechanical obstruction, but will not cure chronic cholecystitis and cannot restore the destroyed wall of the gall-bladder in freeing it from adhesions.

The contra-indications to cholecystectomies are: (1) inability to get a clear field for operation, especially in the very obese; (2) stenosis of the common duct; (3) pancreatic disease.

The author in doing a cholecystectomy gets a clear field, starts his dissection from the fundus of the gall-bladder, ligates the cystic artery separately and provides drainage.

C. A. BOWERS.

Willis, A. M.: Cholecystectomy Without Drainage.
J. Am. M. Ass., 1917, lxi, 1943.

The author gives the results in 549 gall-bladder operations and describes the technique followed by him in cholecystectomy.

A right rectus incision, curving toward the xiphoid at the upper end, is used. An incision is made into the hepatoduodenal ligament, and the pelvis of the gall-bladder is grasped and pulled upward while a right angle clamp seizes the cystic duct and artery. The author believes that this method of securing the duct and artery absolutely obviates the danger of injuring the common duct in the procedure. A ligature is then put around the cystic duct close up to its junction with the common duct and a second ligature is placed around the cystic duct and artery and the two are cut, the gall-bladder being dissected out from below upward. The stump of the cystic duct is secured in the ligament by means of a crown suture passing through both layers of peritoneum and around the stump. The raw surface is covered with peritoneum and the abdomen closed without drainage.

In the author's series of 549 operations there were 398 cholecystostomies with a mortality of 1.7 per cent, 107 cholecystectomies with a mortality of 0.9 per cent, and 44 choledochotomies with a mortality of 9.0 per cent. There were 26 secondary operations, 21 following cholecystostomy and five following choledochotomy. The death occurring in the cholecystectomy group was in the case of a woman aged 66 with a simple case of cholelithiasis. The gall-bladder was ruptured during removal and the abdomen was closed without drainage. The patient suffered urinary suppression and died three days after operation. At necropsy a small abscess was found between the liver and transverse colon and an acute nephritis was revealed.

JOHN W. TURNER.

Vincent, W. G.: Malignancy of the Biliary Apparatus. *Med. Rec.*, 1917, xlii, 933.

From October, 1914, to March, 1917, about 22,000 patients have been admitted to the New York Postgraduate Hospital. During this same period there have been 15 cases in which malignant tumor of the liver was such an outstanding feature

of the pathologic condition as to be made the principal diagnostic heading on the discharge card, and the same applies to 10 cases of malignancy of the gall-bladder and one case of carcinoma of the papilla of Vater.

Primary carcinoma of the liver is rare. It may occur at any age, but it is comparatively rarely seen before the age of forty. Castle finds that 42 cases of primary carcinoma of the liver in individuals up to the age of sixteen have been reported. While carcinoma of the gall-bladder occurs more frequently in women than in men, the opposite condition obtains as regards primary cancer of the liver. The secondary involvement is much more common in women than in men.

Primary carcinoma of the liver may be single or multiple and usually originates in the region of the gall-bladder, the hilus of the liver or the bile-ducts; rarely from the parenchyma cells. Many hold that cirrhosis or syphilitic cicatrization is the primary affection and carcinoma development secondary.

The description of the three forms of primary carcinomatosis of the liver as outlined by Zeigler follows:

The symptoms depend largely upon the site, size, and histologic character of the growth and degree of involvement of the surrounding structures.

Early diagnosis cannot be positively made without exploratory laparotomy. The prognosis is very bad; and as for treatment, early radical operation offers the only opportunity, and in a few instances this has been obtained.

Primary sarcoma of the liver is very rare, but many metastatic cases have been reported. The symptoms are similar to those of hepatic carcinoma. The treatment is hopeless. Carcinoma of the gall-bladder is much more common than carcinoma of the liver. The primary etiological factor is gall-stones. The growth takes the form of a papillary or fungous tumor, or a cancerous ulcer.

Primary carcinoma of the gall-bladder is extremely rare. Symptoms are very similar to those of carcinoma of the liver, but there is in addition usually a history of gall-stones. Unless the condition is recognized very early, operation offers practically no cure.

Primary carcinoma of the bile-ducts differs from carcinoma of the gall-bladder in a number of particulars. First, it is more frequent in men than in women; second, usually the first symptom that calls attention to the biliary apparatus is jaundice. Most of the cases occur in the common duct or at its junction with the cystic and hepatic ducts. The growth is of the annular type, or occurs as a papillary outgrowth into the lumen. The symptoms are jaundice, which generally begins insidiously and gradually increases in intensity, and which once established is permanent; cachexia and rapid loss of strength; pain in the epigastric or gall-bladder region, usually of dull aching character but occasionally colic-like when the gall-bladder

attempts to empty itself, and enlargement of the gall-bladder.

The principal condition from which carcinoma of the ducts must be differentiated is stone in the common duct. In this latter condition the jaundice usually occurs suddenly, is always intermittent, and the entrance of bile into the intestine is never permanently blocked.

With carcinoma, on the contrary, once the passage of bile is blocked, acholia is permanent unless connection with the gastro-intestinal tract is restored by operative means. The pain in calculous obstruction is sudden and severe and apt to radiate, while that of malignant disease is usually dull, dragging, and persistent. Cachexia and rapid loss of strength would also point to malignant rather than to calculous disease. The treatment is the prophylactic early removal of gall-stones.

Carcinoma of the papilla of Vater is a rare condition. The symptoms are those of interference with the flow of pancreatic fluid and the bile, together with symptoms of obstruction in the duodenum. The treatment is by excision if possible, together with provision for the re-establishment of the flow of bile into the gastro-intestinal tract. In most cases gastro-enterostomy is also required.

E. C. ROBITSEK.

Grey, E. G.: The Diversion of the Pancreatic Juice from the Duodenum into the Stomach; Its Effects upon the Level of Gastric Acidity and upon the Pancreas. *J. Exp. Med.*, 1917, xxvi, 825.

Recent work has shown the important part played by the alkaline duodenal contents, the pancreatic juice in particular, in the maintenance of a uniform level of gastric acidity. The author also comments on the fact that it has been demonstrated experimentally that a regurgitation of duodenal juices, after the ingestion of certain foodstuffs, is of such regular occurrence that the process has been regarded as an accompaniment of normal gastric digestion; and furthermore, that neutral, alkaline, or feebly acid fluids provoke a secretion of acid juice in order that the gastric acidity may be brought to the normal level. There is but little evidence, however, to show how the level of gastric acidity is affected when alkaline solutions are introduced into the stomach more or less continuously throughout the period of digestion.

The present report is based upon the results obtained from experiments carried out on seven dogs. Inasmuch as the principal purpose of the investigation was to follow the changes in the acidity level of the stomach, it seemed best to the author to analyze specimens of the test meals instead of studying the pure gastric juice, which was the method employed in previous experiments. For this purpose the gastric fistula as devised by Janeway proved to be very satisfactory to the author. All the animals were anesthetized with ether.

A small three-sided piece of stomach wall was turned down toward the greater curvature. This constituted a rectangular flap with its blood supply intact. By sewing the lateral margins together and closing the opening in the gastric wall a small tube was formed which was lined throughout by mucous membrane. The distal end was then sewed into the abdominal wall, care being taken to anchor it to the peritoneum, fascia, and skin. The mucosa and skin, of course, were sutured together.

In experimenting with the reconstruction, a very important feature was noted. During the first weeks subsequent to the operation there was a marked retraction of the new tube toward the peritoneal cavity, with a definite contraction of the external opening. The effects of these changes, however, Grey found could be greatly minimized if care was exercised during the operative procedure to anchor the tube in the abdominal parietes so that it protruded for several centimeters above the level of the skin, which could be done without embarrassing the blood supply.

Inspection of one of the fistulae three or four months subsequent to its construction showed a lead-pencil-like tube, 4 or 5 cm. in length, extending through the peritoneal cavity from the abdominal wall to the stomach, which the author found to interfere but little with the normal gastric movements.

A standard mixture of 70 gm. of ground raw lean beef and 75 ccm. of tap water was used as a test meal, several dozen meals being given in each case. The dogs received the same diet each day. Water was withdrawn after the test meals had been given, but throughout the balance of the day the animals were permitted to take as much water as they desired. Samples were withdrawn for analysis two and three hours after the ingestion of the meal.

The experiments reported in this paper, Grey states, were carried out for the purpose of ascertaining how the stomach would react, in as far as the secretion of hydrochloric acid is concerned, to a more or less continuous influx of relatively strong alkaline fluid, prolonged throughout the cycle of digestion. Numerous studies have shown that any serious interference with the process of regurgitation leads to a rise in the acidity level of the stomach, i.e., to a state of hyperacidity, but there is little evidence to indicate whether the acidity level will be depressed temporarily or permanently when alkaline material in considerable amounts continues to enter the stomach.

The influx of alkaline fluid was provided for by transplanting the larger pancreatic duct into the wall of the stomach after ligating and dividing the lesser duct. Specimens of test meals for analysis were withdrawn through gastric fistulae made after the method of Janeway.

Animals prepared in this manner served also to furnish additional information regarding the possible relation of the hydrochloric acid of the gastric juice

to certain acute inflammatory and chronic sclerotic changes in the pancreas.

From the results of his experiments it appeared to the author that the presence of a considerable amount of pancreatic juice in the stomach throughout the period of digestion led only to a moderate decrease in the acidity level of the ingesta in the later stages of digestion. Earlier in the process there was no constant alteration of the acidity level in either direction. The findings served not only to corroborate the views of Boldyreff, but also to demonstrate the remarkable compensatory activity of the gastric glands under conditions which entailed an unusual quantity of alkali in the stomach.

In addition, the author's work has shown that when the larger pancreatic duct was properly transplanted into the wall of the stomach, it might remain patent for months. In animals in which this operative procedure was carried out, the pancreas was found to undergo no inflammatory or other degenerative changes. This finding he regards as evidence against the postulate of Hlava that gastric juice is probably responsible for the occurrence of certain cases of acute hemorrhagic pancreatitis.

GEORGE E. BEILBY.

Maurizi, M.: Acute Pancreatitis (Le pancreatitis acuto) *Gazz. d. osp. e d. clin.*, Milano, 1917, xxxviii, 1891.

Maurizi thinks that acute pancreatitis is more frequent than is believed. Its differential diagnosis from acute peritonitis, intestinal occlusion, acute appendicitis and cholecystitis is very difficult. In such cases urgent intervention is indicated, and the operator, in addition to finding the pancreas swollen and marbled, will find round spots the size of a two-centesimi piece disseminated in the omentum, in the mesentery and in the parietal peritoneum. These spots are characteristic of acute pancreatitis and are due to a true intracellular digestion of fat.

W. A. BRENNAN.

Goto, K.: The Relation of the Spleen to Blood Destruction and Regeneration and to Hemolytic Jaundice; the Influence of Splenectomy and of Blood Disintegration upon the Production of Blood Pigment. *J. Exp. Med.*, 1917, xxvi, 795.

The elimination of bile pigment and the changes following the administration of a hemolytic agent were studied both before and after splenectomy in dogs with a bile-duct-ureter anastomosis; at the same time studies were made of the red cell and hemoglobin content of the blood.

Four dogs of approximately the same size were used. They were fed on a standard diet containing 0.4 gm. of nitrogen per kilo and 70 calories per kilo of body weight. The diet consisted of beef heart, lard, bread crumbs, sugar, a little salt, and some bone ash. The daily intake of water was always the same.

The importance of keeping the test animals on a constant diet for bile pigment determination is obvious from the observations of Hooper and Whipple, who have shown that carbohydrates tend to increase considerably the secretion of bile pigment in dogs with bile fistula and also that on a strict meat diet the bile pigment curve is at its lowest level.

Instead of the usual external bile fistula, the bile-duct-ureter fistula of Pearce and Eisenbrey was employed. The method consisted in diverting the bile from the intestine to the urinary bladder by anastomosing the common bile-duct and the right ureter, after removal of the corresponding kidney. It had several advantages for long-continued observations and avoided some of the troubles of the external fistula, such as obstruction, infection, and losses due to accidents in collecting. The mixture of urine and bile, in the absence of jaundice, offered no difficulties for the quantitative determination of bile pigments.

Several days after this operation a preliminary blood examination was made, and if anemia was absent and there was no evidence of obstruction of flow of bile to the bladder, the urine was collected from the cage every morning for one week and the several lots were combined for quantitative estimation of bile pigment. The animals were not catheterized, the urine being collected daily and preserved in cold storage until the quantitative determination of bile pigment was made.

The general outcome of these experiments is shown by the author in a series of four tables, and from these he summarizes the obtained results as follows:

In four animals with a bile-duct-ureter anastomosis and without disturbance due to obstruction or absorption, the total quantity of bile pigment output during a day under normal conditions varied from 0.0618 to 0.0678 gm. These figures were practically identical with those of Stadelman but lower than those given by Hooper and Whipple, who found that the average bile pigment excretion amounted to about 1 mg. per pound of body weight per 6 hours.

In all the experiments there was definite evidence of a decrease in bile pigment elimination after splenectomy. This was true not only of the elimination when no hemolytic agent was administered but also when excessive blood destruction was caused. Under the latter circumstances the amount of bile pigment was greatly increased but never reached the high level of blood destruction before splenectomy.

These observations appeared to the author to show conclusively that the absence of the spleen influenced the formation of bile pigment. To what extent the influence was mechanical, i.e., the change in the course of the blood to the liver, and to what extent due to anemia, the author is unable to say from the present experiment.

GEORGE E. BEILBY.

MISCELLANEOUS

Bench, W. M.: The Relation of Hemorrhoidal Disease to the Health Balance. *Tr Am Proctol Soc.*, New York, 1917, June.

The author discusses the relationship of hemorrhoidal disease to the health balance as marked by the following factors:

1. The deleterious effect upon the patient's mind by increasing his irritability and making him anxious and morose.

2. The many reflexes coincident with ulcerated large or small types of hemorrhoids.

3. The influence upon the so-called vegetative functions of the body and intimate association with diseases of the heart, lungs, liver, and kidneys.

4. The refractory or retro-active relationship in most cases of constipation.

5. The tendency of neglected cases toward infections and cancer.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Bayer, V.: Filling of Infected Bone Cavities. *München med. Wochenschr.*, 1917, No. 19.

When there is a mechanical obstacle to the outflow of pus from an infected bone cavity, recovery is much delayed and may not occur. The most unfavorable site for such cavities is the upper part of the tibia.

The author in such cases makes an inside perforation of the tibia and effects a discharge of pus through the calf musculature. The procedure is analogous to the drainage of the knee-joint toward the back. Compared with other methods, the operations show that rear drainage is rapid and much more effective. Shutting off the tibial cavity may be dangerous. Filling of the cavity by the organism itself rather than by the usual substances was considered best, and this is promoted by favoring the proliferation of granular tissue as much as possible. Such granulation develops best in moist surroundings. The author therefore keeps the cavity irrigated by fluid which constantly drips. The pus is washed out from all crevices by a strong jet every twelve hours.

The author, after testing the value of several solutions for the proliferation of granular bone tissue, finds that distilled water when not too cold is best. There was more suppuration when other fluids were used. The progress of granulation may be observed almost from day to day. Bone cavities are generally cured in a few weeks, leaving a smooth surface without either anfractuosity or fissure.

W. A. BRENNAN.

Cavina, G.: Penetrating Gunshot Wounds of the Knee (*Le ferite d'arma da fuoco penetrate nel ginocchio*). *Pelidina*, Roma, 1917, xiv, 22, *prati*, 1441.

The author treated 101 knee wounds, in all of which the joint was involved. There were only 8 deaths. The others recovered, with 3 thigh amputations and 4 resections.

In treatment the author thinks complete im-

mobilization of the limb from the foot to the pelvis inclusive is of primary importance. When there is infection, the treatment of choice is arthrotomy, and in very grave cases, resection.

W. A. BRENNAN.

Pauchet, V.: The Treatment of Hip Wounds (*Plaies de la hanche; traitement*). *Presse méd.*, Par., 1917, p. 701.

Pauchet summarizes the actual treatment of hip lesions in the war. The operative indications are as follows:

1. In recent intra-articular fractures six to twelve hours old, arthrotomy, surgical clearance, removal of débris, regularization of the cervical stump, ether lavage, and filiform drainage.

2. In intra-articular infected fractures, the same treatment, followed by the Carrel method.

3. In recent extra-articular fractures, the same treatment as a complicated fracture, with the removal of foreign bodies and any loose fragments.

4. In recent infected extra-articular fractures, the same treatment as in the preceding case, with the Carrel method.

5. In infected extra-articular fractures, if the patient shows little resistance, subperiosteal resection.

6. In extra-articular infected fractures fifteen to twenty days old, subperiosteal resection with Ollier's rugine.

The techniques followed are:

1. For intra-articular fractures, Bernhard's technique. This involves incision following the axis of the femoral head and neck; exposure of the joint; incision of the capsula; resection; trimming the edges of the wounded soft parts; drainage.

2. For extra-articular fractures, Alquier and Tanton's technique, which provides external vertical incision commencing on the external face of the trochanter; exposure of the great trochanter; uncovering the capsula and splitting it; surgical clearance with the rugine, curette and osteotome.

The postoperative care is as important as the operation itself. Immediate orthopedic treatment consists of (a) immobilization; (b) position. Immobilization is effected by a plaster cast, four articula-

tions being included, namely, the two hips, one knee and one foot. The limb is placed in abduction and slight external rotation. In cases of intra-articular resection, the thigh should be in slight flexion on the pelvis. In extra-articular resections the complete thigh will be put in extension.

For intracapsular fractures, immobilization will last two to three months; and in the case of extra-capsular, three to six months.

Later orthopedic treatment provides for the replacing of the plaster apparatus by a celluloid walking apparatus with a Reclus stirrup and the use of crutches for a time.

The article is well illustrated. W. A. BRENNAN.

Terada, M.: Myositis Purulenta Acuta Caused by Bacillus Typhosus; Report of a Case. *J. Am. M. Ass.*, 1917, lxi, 2101.

A case in which the typhoid bacillus produced pus is reported. The lesion occurred in the right upper arm from the elbow to the deltoid insertion, beginning as a painful reddish swelling about two weeks after the onset of chills and fever. Incision brought forth a seropurulent discharge from the wound, from which an organism was cultivated and found to be identical with one cultured from the blood of the patient. This organism showed the cultural characteristics and responded to the immunological test of bacillus typhosus.

The patient had a negative Widal reaction nine and fourteen days after the onset of the fever, but autopsy findings and the clinical course of the disease, including rose spots, a temperature of 40.2°, and typical ulcerations of Peyer's patches in the intestines, justified the diagnosis of typhoid fever.

W. A. CLARK.

Clark, H. C.: Etiologic Factors in Gross Lesions of the Large Joints: Observations from 1,100 Consecutive Necropsies. *J. Am. M. Ass.*, 1917, lxi, 3099.

As a result of 1,100 autopsies on subjects from the laboring people in the Canal Zone, 172 cases of arthritis were found. Less than one per cent of those showing the lesions had been considered as arthritic suspects. The routine examination of the large joints at autopsy was undertaken when it was noticed that a number of the laborers who showed a positive Wassermann test had associated with their clinical history some ill-defined joint symptoms. Those cases showing a degenerative type of arthritis associated with a positive Wassermann or with lesions frankly syphilitic were classed as syphilitic and of these there were 96 out of the 172. The next largest group comprised 33 cases showing arteriosclerotic changes. Of the remainder, 10 were classed as gonococcus, 11 staphylo- and streptococcus, 10 undetermined, 4 tuberculosis, 2 pneumococcus, 2 meningococcus, 2 traumatic, 1 pellagra and 1 scurvy.

The lesions found in the two large groups were all

about the same type. The knee was the most common of the joints involved. The joint cavity was usually dry or partially filled with a gelatinous straw-colored material, and the synovial membrane sometimes thickened, red, and granular. The cartilages were always worn and sometimes almost destroyed at the points of pressure, such as the femoral condyles and head of the tibia. In extreme cases large areas of bone were exposed at the points of pressure.

W. A. CLARK.

Mally and Corpechot: Traumatic Monomyoplegias (Monomyoplegies traumatiques). *Rev. de chir. Par.*, 1917, lii, 281.

The authors' study is based on a group of lesions of the peripheral nervous system caused by modern projectiles of war. The following conclusions are reached:

1. The term monomyoplegia is applied to the paralysis of a muscle due to injury of its motor nerve system after emergence of the corresponding nerve.

2. Modern projectiles, owing to their special penetrative qualities, very often cause paralytic complications of a monomuscular type such as were rarely observed before the present war.

3. Such paralyzes show the same clinical signs as paralyzes due to lesion of the great peripheral nerve-trunks, the same alterations of electrical excitability of the paralyzed muscles, with the same course and an identical prognosis.

4. Their particular type is characterized by the localization of the paralysis to one or several related muscles; and the functional importance is confined generally to the effect on the muscle group.

5. The etiologic factor is a lesion of the nerve filaments innervating the muscle or of the terminal or collateral ramifications of mixed nerves, or of their intramuscular zone.

6. Such myoplegias, in case of incurability, call for surgical intervention. Owing to the technical surgical difficulties of dealing directly with such minute nerve lesions, surgical treatment may have to be confined to prosthetics.

W. A. BRENNAN.

Habhegger, C. J.: Acute Osteomyelitis of the Clavicle. *Am. J. Surg.*, 1917, xxxi, 309.

Froehners' statistics show that acute osteomyelitis of the short and flat bones is of much less frequent occurrence than osteomyelitis of the long bones. This is probably due to the structure of the bones and the fact that their growth is less rapid than that of the long bones. The clavicle is the most frequent of the bones classified as short or flat to become the seat of osteomyelitis infection. While structurally a short or flat bone, its growth at certain periods is quite rapid and it is subjected to great pressure and strain, as are long bones. It therefore really occupies a position between the short and flat bones, and the long bones. Infections of the clavicle have at times the characteristics of similar infections of short or flat bones, which are usually quite mild, and again

those of infections of the long bones, which as a rule are quite destructive. In acute osteomyelitis of the clavicle all grades of inflammatory processes take place from the mildest type with little or no destruction of bone to the most virulent and destructive type with necrosis of the entire bone and grave general symptoms.

The author's collection of 17 reported cases shows a mortality of 9.24 per cent. Of these, 12 were males and 5 were females. The majority of the cases occurred between eight and sixteen years, although quite a number of cases reported occurred in the very young and in adult life. As etiological factors, traumatism played a part in about a quarter of the cases reported. Infection of the upper extremities was present in about 16 per cent of the cases.

The symptoms are those of a severe inflammation of the clavicular region, accompanied by fever and prostration, and terminating in necrosis of the whole bone with the formation of an abscess and fistulous opening; in the less acute cases, limited necrosis with abscess formation and fistulous openings or enlargement of the bone with osteoporotic changes terminating also in caries of a greater or lesser degree.

The bacteriology corresponds in the main to that of osteomyelitis of the long bones. The operative procedure most employed has been total resection of the clavicle with preservation of the periosteum, although in some cases partial resection or sequestrotomy has been followed by good results. Klem believes that a total resection should always be resorted to in cases of osteomyelitis of the clavicle, because it is frequently impossible to distinguish healthy from diseased bone, and recurrence of the disease cannot follow a total extirpation.

Winslow, R.: *Fungous Diseases of the Foot or Madura Foot in America*. *Ann. Surg.*, Phila., 1917, lxx, 427.

Madura foot occurs in three forms, the white or yellowish, the black, and the pink or red varieties. These varieties are so classified from the appearance of certain grains or particles that escape with the discharge from the sinuses that are found in the affected part. The most common form is the white or ochroid; next in frequency is the black or melanoid, and least frequent is the red or pink variety.

The ochroid or white form of the disease when examined under the microscope shows fungi that resemble very closely the actinomyces, and it is probable that some, at least, of the reported cases are due to the ray fungus. In some of these cases, however, the granules resemble fish roe in appearance and are probably not due to the ray fungus.

The granules from the melanoid or black differ very materially in appearance and characteristics from those of the ochroid form, being black in color like grains of gunpowder, and hard and resistant to pressure, while those from the ochroid variety are light in color, soft and easily crushed. From the

observations of Wright and others it is evident that the ochroid and melanoid forms of the disease are not due to the same fungus or organism, the ochroid variety being due to a streptothrix, while the melanoid form is due to a more highly organized fungus or hyphomycete.

Clinically mycetoma is a chronic inflammatory condition, usually, but not invariably, affecting the tissues of the foot, in which the foot becomes much enlarged, with nodular masses that break down and form sinuses, from which a thin purulent fluid escapes. In this discharge are seen pale or black bodies which when examined microscopically reveal the nature of the affection.

There is often a history of some injury of the foot, such as the penetration of a thorn or splinter. The disease therefore usually begins on the sole of the foot as a small swelling, painless at first, but, as the condition progresses becoming painful and interfering with locomotion. As the infection extends, other nodules form and suppurate, causing fistulous tracts which open externally. Eventually the whole foot becomes much swollen, with a brawny, nodular induration, and with numerous fistulae discharging a thin serous pus containing the characteristic granules. The motions of the foot seem to be limited more by the inflammatory swelling of the soft parts than by destructive lesions of the bones, though a rarefying osteitis of the bones of the foot is also present. The disease never heals spontaneously but progresses slowly, without causing marked cachexia. Eventually, however, it terminates fatally unless arrested by appropriate treatment.

The conditions for which mycetoma is most likely to be mistaken are tuberculosis and sarcoma. As medical treatment is of no avail, amputation above the seat of the disease is the only remedy.

Up to the present time only seven cases of mycetoma have been reported in the United States and Canada. The case here reported is of a man who sustained a wound on the inner side of the instep. At the time of the injury he was wearing a pair of shoes that were covered with manure from the horse stable. The wound soon healed, but two months later an abscess formed at some distance from the original wound, which opened and gave exit to foul pus. This abscess healed and there was no further trouble until the next summer when another abscess, as large as a silver dollar, formed, which upon opening let out considerable pus. This never healed. Later the foot began to swell and the joints became very stiff and painful. He had two sick horses and a cow under his care, all of which died; one horse had a lump under the jaw. On an adjoining farm three horses died which he visited and to which he administered medicine.

The man's symptoms increased in severity. The foot became greatly enlarged, and locomotion gradually became impossible. On admission to the hospital, there was an extensive brawny swelling of the left foot extending from the tarsometatarsal

junction to above the ankle and involving the whole circumference of the foot. The skin was much indurated, and a very thin pus containing yellow particles exuded from, or could be pressed from, numerous sinuses upon the surface of the foot. The glands in the groin were somewhat enlarged. A leucocyte count of 11,800 was found. An examination of the granules from the sinuses revealed actinomyces in abundance. An amputation in the middle of the leg was performed and he made a speedy recovery.

M. A. BERNSTEIN.

FRACTURES AND DISLOCATIONS

Delorme, E.: Gunshot Fractures and Especially Their Displacements (Des fractures par coup de feu et en particulier de leurs déplacements). *Arch. de méd. et pharm. mil.*, Par., 1917, lxxvii, 1.

Delorme gives an extensive study of the mechanical factors concerned in gunshot fractures in the present war. This study in the first place has shown: (1) that the German bullet does not differ in its effects from its predecessors; (2) that shrapnel bullets produce very clear types of diaphyseal and epiphyseal fractures; (3) that shell fragments and other explosives act like bullets and cause the same type of lesions. These lesions are: (1) fractures without displacement; (2) simple fractures with displacement; (3) compound fractures more or less comminuted with displacement. In the present war, as in previous wars, these are the main types of diaphyseal fractures and in them the laws which have been established experimentally have been verified, viz: (1) that a diaphyseal fracture is the less extensive in length, the greater the velocity of the bullet; (2) but the greater the velocity of the bullet, the more comminuted is the fracture.

Diaphyseal fractures from gunshot are less frequently followed by large displacements than the fractures of civil life. In the latter the agent which causes a comminuted fracture usually involves a larger surface of bone than does a projectile, and better realizes the conditions necessary to produce displacement. The effect is continued after the breaking of the bone. The effect of a bullet is more destructive, but is fleeting.

The very nature of a gunshot fracture tends to limit the amount of displacement of the osseous fragments. A projectile is less powerful in producing displacements than ordinary causes, since its force is more direct and propulsive and acts rather on the splinters created by it. Besides, muscular action, which is the second cause of fragmentary displacement, is less effective in gunshot fractures than in others. However, if displacement is complete, gunshot fractures follow the same laws as others, and the lesion is aggravated if the patient has to be transported to a distant hospital with all the risks to which he may be exposed during transit; hence the advantage of operating upon fractures as near the front as possible.

Delorme gives a detailed study of diaphyseal and

epiphyseal fractures of the hand, wrist, arm bones, elbow, humerus, and shoulder, together with several illustrations. In a later article the fractures of the lower limb will be dealt with.

W. A. BRENNAN.

Tanton, J.: Traumatic Dislocation of the Pubic Symphysis with Important Diastases, Without Urethrovesical Lesions (Dislocation traumatique de la symphyse pubienne avec diastase importante, sans lésions uréthro-vésicales). *Bull. et mémo. Soc. de chir. de Par.*, 1917, xliii, 1136.

Tanton in 1916 reported a case of traumatic symphyseal diastasis without urethrovesical lesions. He now reports a second case due to an automobile accident. The patient also showed a fracture of the humerus with subcoracoid dislocation.

The pubic diastasis, which was originally two fingers wide, was reduced almost completely, being helped by the application of a compressing pelvic girdle.

W. A. BRENNAN.

Taylor, G.: The Treatment of Fractures of the Long Bones. *J. Roy. Army M. Corps*, Lond., 1917, xxix, 493.

The author's experience in treating war fractures in the Cambridge Hospital, Aldershot, leads him to conclude that in gunshot fractures every effort should be made to gain the best possible alignment at the very outset by non-operative measures, and to maintain that alignment by means of such splints as absolutely immobilize the fragments, thereby promoting union, controlling and limiting bacterial activity and relieving pain. In the case of gunshot fractures, even late plating should be reserved for very exceptional cases. The author quotes a number of cases, with illustrations, to support his views.

W. A. BRENNAN.

Cahill, G. F.: Fractures of the Os Calcis. *Ann. Surg.*, Phila., 1917, lvi, 711.

Fractures of the os calcis form from two to four per cent of all fractures. Usually the condition was overlooked or a mistake was made in the diagnosis until the injured foot and ankle were submitted to the X-ray.

The calcaneum forms with the cuboid an arch, which is part of the bony structure forming the arch of the foot. The os calcis is the base of the posterior pillar and its structure is such that it gives the greatest carrying strength for its weight. A fall, the usual cause of injury to the os calcis, causes a breaking down of this arch, generally in the direction of the posterior pillar. This is due to the fact that the posterior pillar is more directly under the line of the body, is more rigid and less elastic, is shorter and its arch has a shorter arc. The denser astragalus is usually driven into the calcaneum and the fracture is usually impacted and comminuted.

Fractures of the os calcis are fractures of adult life. The average age in this series of 51 cases was 41 years, the youngest 14, and the oldest 73 years.

The rarity of the fracture in children is probably due to the elasticity of children's feet and the fact that they are found in such a large proportion in cartilage. There were 68 males to 4 females.

Fracture of the os calcis was due to a fall in 63 cases, to crushing injury in 4 cases, twisting in 2 cases, muscular action in one case, and strain by being caught in a pulley by the heel in one case.

The right os calcis was fractured 33 times, the left 31 times, and both simultaneously 8 times.

In attempting to classify the 72 cases studied, it was found impossible to group them according to Cabot and Binnie's or Lounsbery's classification of fractures of the os calcis. They were therefore classified as follows:

1. Simple fissure or linear fractures without any displacement, 14 cases.
2. Linear fractures with displacement, 10 cases.
3. Comminuted fractures with little displacement, 11 cases.
4. Comminuted fractures with marked displacement, 37 cases.

The signs and symptoms of fracture of the os calcis are pain in the ankle and heel with inability to bear the weight of the body on the foot. Swelling is usually most pronounced under both malleoli and under the heel. Ecchymosis is usually a little late in appearing. Crepitus was made out in only 10 cases. Motion is impaired at the ankle, most marked in lateral motion. The X-ray is necessary to diagnose the type of fracture.

The treatment of these 72 cases fell into three groups: (1) operative, 2 cases; (2) immobilization without any attempt at reduction, 56 cases; (3) immobilization with attempts at reduction, 14 cases.

Two cases were operated upon; one case with a linear fracture of the posterior part of the calcaneum with marked upward displacement of the posterior fragment was treated by nailing the fragment back through a posterior incision. The result was poor, the tendo achillis sloughing, with subsequent disability. The other case was one with a loose fragment of the posterior part of the os calcis, and very marked upward displacement of the posterior fragment which was sutured back with kangaroo tendon. The subsequent result was good.

The majority of the cases were treated by simple immobilization with a plastic cast or a molded plaster splint with the foot placed at right angles to the leg and the patient made ambulatory with crutches.

Those cases treated by immobilization with attempts at reduction were treated by manipulation to loosen the displaced fragments, traction made on the heel, and the leg and foot put up in a circular plaster with the foot in extension to relax the pull of the calf muscles.

The results of treatment of fracture of the os calcis are generally poor. Simple linear or fissure fractures give the best results. The cast should

be left on four weeks and should be followed by passive motion and massage, and the weight should not be borne on the foot for six to seven weeks after the injury.

Where there is a linear fracture, usually of the posterior part with upward and backward displacement of the posterior fragment, unless treated with a view to reducing the displacement, there will be more or less permanent disability. Cabot and Binnie, in order to pull the fragment down, passed an urethral sound above the os calcis inside the tendo achillis, and making traction downward reduced the displacement. Cotton recommends the same procedure, but uses a pair of ice tongs. Lounsbery after reduction cuts the tendo achillis to prevent the pull of the calf muscles.

Open operation with nailing of the fragments has given poor results. In fractures of the extreme posterior part, operation with suturing of the fragment back in place with a kangaroo tendon suture is the only treatment. Comminuted fractures without displacement do not give good results. The results are usually bad in comminuted fractures with well-marked displacement. For this type of case Cotton has laid down the following rules:

1. Loosen up the fracture by manipulation.
2. Pull the heel down.
3. Free the joint motion between the astragalus and calcis.
4. Push in the displaced bone under the external malleolus.
5. Put the foot up in plaster, not at right angles, but with the heel cord slack; also avoid direct pressure over the heel.

The after-care of fractures of the os calcis consists of passive motion and massage. Pain in the sole of the foot is a frequent late symptom and may be relieved by an arch support. Pains in the heel or under the external malleolus are usually due to spurs and had best be removed. V. C. Hines.

SURGERY OF THE BONES, JOINTS, ETC.

Tanton, J.: Late Secondary Resection of the Right Shoulder; Reproduction of Ten Centimeters of Bone (*Réssection secondaire tardive de l'épaule droite; régénération d'une colonne osseuse de dix centimètres*). *Bull. et mém. Soc. de chir. de Par.*, 1917, XLIII, 1653.

The patient in Tanton's case had a very low resection of the right shoulder, below the pectoral insertion on the humerus, the piece removed measuring 14 cm. This was done fourteen days after injury by a shell. After reproduction of about 10 cm. of the bone, the patient shows a shortening of only 3 cm. The shoulder is solid and the function is good. Besides this injury, the man had a comminuted fracture of the thigh, and the anterior half of the internal tuberosity of the right tibia was resected.

The author thinks that such an extensive shoulder resection as was made in this case would, if done

primarily, be followed by a swinging shoulder. The secondary resection has given a solid articulation. The arm was kept in abduction of fifty degrees.

He thinks also that in cases of such extensive resection, mobilization should be retarded, as a general rule. The period of immobilization should be prolonged beyond the ordinary period in order to give the bone time to regenerate and to avoid re-awakening of infection. W. A. BRENNAN.

Mayer, L.: Tendon Operations for Gunshot Injuries of the Hand. *J. Am. M. Ass.*, 1917, lxi, 2107.

Mayer has recently published a series of articles outlining the principles of a new system of tendon transplantation based on the anatomy and physiology of tendons. The essential principle of this system lies in the co-ordination of each step of the operation with the exact anatomic and physiologic facts. At present a double significance attaches to a rational system of tendon operations. First, there is a large group of poliomyelitis cases in which decided improvement of function can be obtained by tendon transplants; secondly, there will be unquestionably, provided the war is not brought to an abrupt conclusion, a large number of patients with gunshot injuries on whom similar operations can be satisfactorily performed.

The technique of his operation on severed flexor tendons consists in transplanting the sublimis tendon of the adjacent finger and suturing it to the distal end of the injured flexor profundus tendon; that is, two adjacent fingers are thus supplied with the profundus tendons alone, since the one sublimis tendon is converted by the operation into a deep flexor.

The steps of the operation, which he does under local anesthesia, are as follows:

Assuming that both flexor tendons of the middle finger have been severed, and that a mass of scar tissue about the size of a fifty-cent piece occupies the midpalmar region and is densely adherent to the bone, the first incision runs from a point two inches distal to the annular ligament in a line with the tendons of the index finger to the proximal phalanx of this finger. The incision is deepened through the palmar fascia until the sublimis tendon is visible throughout its course.

The second incision is made distal to the scar tissue over the severed flexor tendons of the middle finger; it is about one and one-half inches long, slightly bowed, with the convexity toward the little finger, and extends to the base of the middle finger. The flexor tendons of the middle finger are then dissected free from the adhesions which usually bind them down. A subcutaneous channel is then bored with a dressing forceps from the proximal end of the first incision to the second incision. This step of the operation is usually rather difficult, owing to the presence of scar tissue. Then the sublimis tendon of the index finger is divided at the metacarpophalangeal joint, dissected away from the deep tendon and drawn through the subcutaneous channel. It is then

sutured to the flexor profundus tendon of the third finger.

The after-treatment consists in protecting the fingers and hand with a splint for at least four weeks after the operation. The author immobilizes the tendons for two weeks before starting motion. The best exercises are the voluntary contractions of the patient's muscles. Where difficult to secure the patient's co-operation, he employed a galvanic current to secure the necessary muscular contraction. When twenty degrees of motion have been secured, the tendon is strengthened by simple resistance exercises. G. W. HOCHREIN.

Harmer, T. W.: Tendon Suture. *Boston M. & S. J.*, 1917, clxxvii, 808.

In the opinion of Harmer, unretarded strong healing of severed tendons after suture depends upon careful approximation of the severed ends by a stitch which will not destroy many tendon fibers either by transfixing or constricting, and so placed that it will not pull out with early use of the tendon.

Since 1909 he has employed a method of treating severed tendons which is not very widely known. The stitch is of silk and consists in overcasting the lateral margins of both ends of the divided tendon. The overcasting starts about the width of the tendon or a little farther back from the point of division, and comprises several whippings about the side of the tendon down to the line of division, each loop including somewhat less than one-quarter of the circumference of the tendon. When a tendon is ready to be brought together, each end then carries two stitches and each stitch two ends.

The two parts of the tendon are then brought together and the two suture-ends nearest the line of division on one side are tied. The two longer ends on the same side are then tied. Then the two pairs of stitch-ends on the other side are tied. Sometimes after tying the stitch, the severed ends, although in contact, may slightly buckle. This is caused by tying the long suture-ends too tightly and can be corrected by placing a simple stitch between the tendon ends. A dry wound before closing is desirable.

Seeping or actual hæmatomata will probably limit the amount of motion at first, may favor the production of adhesions, or may encourage infection. Care is taken in closing the wound to approximate the fascia and skin separately. No splint is used. Active motion is started as soon as the patient has recovered from the anæsthetic. The author believes it is important to start motion early.

G. W. HOCHREIN.

Skilern, P. G., Jr.: A New Method of Tubulizing a Tendon When Used as a Free Transplant. *Med. & Surg.*, 1917, i, 1108.

Skilern reports a new procedure in tendon work to meet the requirements in the following case:

The patient had cut the flexor tendons in the

right little finger seven months previous to admission to the hospital. Primary suture was attempted but failed. He was unable to flex the little finger, except at the metacarpophalangeal joint, the little finger itself remaining straight during the motion. The patient requested amputation, as the finger was more of an obstacle than an aid.

There was an absence of flexion-power of the terminal and middle phalanges, but no ankylosis of their respective joints. There was a midline scar down the front of the finger, which, however, did not cause flexion contracture.

Under local anesthesia an incision was made along the ulnar border of the little finger from its distal flexion crease to the transverse palmar crease; through these creases incisions were made at right angles to the ulnar border incision and connecting its ends. Then the flap of skin and fat was swung outward on its radial hinge. No flexor tendons were found in the finger itself, but the stump of one of these tendons was found terminating beneath a vincular band over the base of the proximal phalanx. This band was divided and the tendon was freed. When the patient moved the little finger, the tendon was seen being drawn upward by its muscle belly.

A second incision was made over the tendon of the palmaris longus five inches in length. The deep fascia was incised on each side of the tendon and one-fourth of an inch away from it and parallel with it. Without disturbing the fascia in its anterior connection with the surface of the tendon, the latter was raised from the underlying muscle mass, and the cut edges of the deep fascia were sutured together around the deep surface of the tendon. The tendon was then cut above and below, so that its length was 10 cm. The tendon in its sheath was then transplanted to the little finger, one end sutured to the live tendon stump of the flexor profundus minimi digiti, and the other end was threaded beneath two broad ligamenta vincula, which were improvised by tunneling under connective-tissue bridges overlying the phalanges; these bridges were altered remains of the original vincular ligaments. Thus the tendon was brought down to the end of the finger, where it was anchored to the capsulo-tendinous pad over the base of the ungual phalanx. The incisions in the little finger were closed with interrupted sutures of silkworm-gut, with drainage. The forearm wound was closed with black silk.

Two weeks after operation the patient was able powerfully to flex the little finger at the metacarpophalangeal joint and less powerfully at the proximal interphalangeal joint, and but slightly at the distal interphalangeal joint; the range of motion was constantly increasing, however.

This method has the advantage of transplanting the tendon with its own sheath practically *in situ*; that is, its anterior connection with the deep fascia covering it is preserved intact. The nutritional state of the tendon is better preserved, and neither the surface of the tendon nor that of its sheath is

exposed at any time, thus lessening the possibility of a traumatic inflammatory reaction.

The author calls attention to the fact that he never makes a midline incision down the finger, fearing the almost inevitable cicatrix flexion contracture. He prefers a lateral incision, and to permit reflection of the skin flap, he adds, at the extremities of the longitudinal incision, transverse incisions through the normal flexion creases, incisions in these creases heal kindly and without any visible scar.

He calls attention to the fact that novocaine blocking of the ulnar nerve in its groove behind the elbow is ideal for operations upon the little finger, but the Esmarch constrictor when long retained causes great discomfort. G. W. HOCHREIN.

Tuffier, T.: The Functional State of the Stumps in War Patients Amputated in 1914-1915 (*L'état fonctionnel des moignons des amputés de guerre en 1914-1915*). *Arch. de méd. et pharm. mil.* Par., 1916, liv. 349.

The object of Tuffier's research is to discover the best methods of amputation from the point of view of the functional value of the stump. His results are based on reports received from the military orthopedic hospitals and on his own experience of 2,301 cases observed. From a review of statistics he finds that thigh amputations are the most frequent and also that such amputations give the highest percentage of defective stumps. Of a first series of 1,731 amputated cases which he personally investigated, Tuffier finds that in 536 cases the initial operation was insufficient and that subsequent operation was necessary. Of these, 279 patients had to undergo from two to four successive amputations. These statistics show that after an amputation there is a strong possibility of a further operation. In cases of the upper limb there are 90.5 per cent of good stumps; but in the lower limb this figure falls to 60 per cent. The lower limb therefore offers the greatest handicap. The causes for this Tuffier finds is in the type of operation, its time, the site of the lesion, and the complications. Each of these factors is dealt with in detail.

The lesions which render a stump unsuitable for apparatus in 30.9 per cent of amputations are incomplete cicatrization due to ulceration or a fistula, and pain due to pressure of the apparatus; sometimes both are present.

Examination of the end-results of the different types of amputation leads Tuffier to some practical conclusions regarding their value. In the lower limb disarticulation of the hip by a racket incision gives the best prosthetic results. A thigh amputation should be as low as possible. A stump 10 cm. long is the least which gives good leverage, but it is best to leave 14 or 15 cm. of the femur.

A sub- or intratrochanteric amputation is more difficult for apparatus and gives the same functional results as a complete thigh amputation. It must not be ruled out, because it is less dangerous than

coxo-femoral disarticulation. Disarticulation, with or without preservation of the patella, generally gives unfavorable results; an intracondylar amputation is better. Tuffier thinks that amputation of the leg immediately above the joint is an excellent operation which gives favorable functional results without difficulty from the stump.

Tuffier discusses the common faults in leg amputations. They should be made as low as possible; posterior strips rather than external or circular should be cut, and care should be taken that the fibula is not sectioned below the tibia.

High amputation even in the tibial tuberosity gives excellent results, even better than a thigh amputation, and Tuffier recommends it.

Tibiotarsal disarticulation with malleolar section, intramalleolar amputation, gives good functional results.

In the foot, subastragalar disarticulation, calcaneal osteoplastic amputation, and the Syme amputation are to be recommended, but not the Chopart. The Lisfranc amputation is of value.

For the upper limb the results are more satisfactory; there are only 5 per cent of troublesome stumps. The important thing is to amputate as far as possible from the shoulder. In the arm, preservation of the head of the humerus is preferable to a shoulder disarticulation. From a functional viewpoint a stump shorter than four finger-widths does not give satisfactory prosthesis. W. A. BRENNAN.

ORTHOPEDICS IN GENERAL

Brown, L. T.: A Combined Medical and Postural Examination of 746 Young Adults. *Am. J. Orthop. Surg.*, 1917, xv, 774.

This work was undertaken in connection with the examination of the entering class of Harvard College, the orthopedic research being done with special reference to the posture of the body and its relation to other physical conditions.

Schematographic tracings were made of the men. With their clothing removed, they were made to stand with their heels on a line in front of a screen; in this position profile tracings were made first in the natural position assumed by the individual, and secondly, in the best posture obtainable.

The vertical line test was employed as a standard; in those tracings which seemed to be up to the standard, it was found that a line drawn upward from the external malleolus or the mediotarsal region so that it passes through the trochanter or the middle of the thigh would also pass through the shoulder and the front of the ear.

There were four points of variation from the normal on which this series was graded: (1) variation of the head and shoulders from the vertical line; (2) a forward position of the head; (3) a relaxed abdomen; and (4) an exaggeration of the normal curve of the spine.

The standard or normal was graded A. Those who had only one or a slight variation from the

standard were placed in grade B. Those who had two points of variance were graded C, and those who varied to the extreme in some or all points were classed as D.

Out of the 746 examined, there were 50 in grade A, 90 in B, 413 in C, and 193 in D.

In comparing the results with the medical examination, grades C and D were found to be more prone to sickness than grades A or B. Backache was not complained of in classes A nor B, while 26 of class C and 17 of class D gave such a history.

As regards albuminuria, grade A had 1 case, B 1 case, C 14 cases and D 12 cases.

Tonsil and adenoid operations had been done in a slightly greater number of cases in grades A and B than in C and D.

The operation for appendicitis had occurred $1\frac{1}{2}$ times as often in grades C and D as in A and B, while $2\frac{1}{2}$ times as many men in grades C and D as in A and B had had two or more operations.

These studies seem to lend positive evidence to the theory that faulty posture is a cause of ill health, while correct posture is conducive to health.

R. B. COFIELD.

Ambrose, T.: The Treatment of Pott's Disease by Autogenous Tibial Bone Graft; Albee's Operation. *Med. J. Austral.*, 1917, ii, 413.

The advantages of treatment offered by the Albee operation for tubercular spinal disease are shown by the author. The operation is not difficult to surgeons accustomed to bone work, but some discretion should be shown in the selection of cases; the very young and weakly and those with exaggerated deformities should be carefully considered before operation is advised.

The advantage, the author states, is in lessening the time of treatment. Eminent authorities place the duration of the treatment at from five to seven years. Albee's operation enables the patient to get about without support of any kind after six to eight weeks of recumbency.

There are practically no contra-indications, according to Albee, except a septic condition of the skin over the area involved. Even abscess formation is no contra-indication to the operation.

The purposes of the operation, aside from reducing the duration of treatment, are to relieve pain and prevent further deformity.

The technique of operation is as follows:

An elliptical or quadrilateral flap of skin and fat is reflected to avoid a midline scar. The spines and intraspinal ligaments are incised with scalpel and chisel, the spines split and one-half broken off, but left attached by soft tissues. One or two spines above and below the affected area are also split as mentioned. Into the gutter thus formed is inserted an autogenous bone graft removed from the tibia. Albee insists that the graft be so cut as to include periosteum, bone, endosteum and bone-marrow. The author has had good results by using a graft from the crest of the tibia. The graft is secured in

place by strong chromic catgut or kangaroo tendon. The strong dorsal aponeurosis is then secured over the site of the graft.

JOHN MITCHELL.

Funk, E. H.: *Osteitis Deformans. Med Clin. N. Am.*, 1917, 1, 457.

The author calls attention to the rarity of a disease in the fact that only three cases were noted among 38,000 admissions to the New Jefferson Hospital during a period of seven years. There are only records of 237 cases in the literature. Funk's case was a woman, white, aged 57. She complained of rheumatic pain in the upper part of her right leg and shortly afterward noticed that the thigh was bending and that there was a limp in her gait. The pain gradually became less severe, the deformity more and more marked, and the leg became shorter.

On examination the right femur showed marked thickening throughout its entire course, and a marked outward curvature. The X-ray study of the right femur showed the characteristic bone changes of osteitis deformans. The bone was unusually dense. The great trochanter and the neck of the femur had a more spongy appearance than is characteristic in the disease. There was an entire lack of bone detail in the pelvic bones around the acetabulum on both sides, indicating that these bones were involved. The skull, which was not much thickened, showed very early involvement.

The symptoms of the disease are first vague pains, usually in the extremity or back. Later there is a local bone deformity, usually a thickening and curvature of the tibia or perhaps an enlargement of the skull. A hereditary history was obtained in seven per cent of these cases. The disease occurs usually after forty years of age. Cases as early as twenty and as late as seventy-nine are on record.

The Wassermann reaction is positive in only one-fifth of the cases. Antiluetic treatment has been tried without avail. Disease of the ductless glands is supposed to be the cause of osteitis deformans. Treatment with a view of influencing the calcium metabolism is being tried, there being at present no satisfactory treatment. The prognosis as regards cure is hopeless, although as regards life the disease is often compatible with a long and active career.

J. J. KURLANDER.

Porter, J. L.: *The Treatment of Rheumatoid Arthritis of the Hypertrophic Type. Internat. J. Surg.*, 1917, xxx, 285.

While learning something definite of the underlying etiology of hypertrophic rheumatoid arthritis, the author asserts, its treatment continues to be empirical. The aim has been chiefly to relieve the pain and make the patient comfortable. Every means has been exhausted to "hunt out the focus of infection and eradicate it." The whole system has been examined for a lurking place for infection.

The author is convinced that the great mistake made in the treatment of rheumatoid joint affections

has been to permit the patient to use the joints. Nature offers the mode of treatment, but it has not been recognized. The patient himself says that motion makes the pain unbearable.

The following treatment, as advocated by the author, is given as a preliminary measure to a course of investigation of the physical, chemical, and bacteriological etiology of the affection.

The patient is first put to bed. The affected part is swathed in strips of gauze saturated with this lotion: tr. opii, 30; liq. plumbi subacet. dil., 40; tr. arnicae 50; fld. ext. hamamelidis, 60.

The joint is then covered with flannel fomentations wrung out of hot water. About this is wrapped a rubber sheet. Hot water bottles are placed upon the rubber sheet. Fomentations and hot water bottles are renewed every two or three hours or as often as they get cool. The gauze strips are moistened three times a day.

If the spine is involved or the sacro-iliac joint, knee, hip or elbow traction is applied with a weight and pulley. The spine is treated by means of a head halter making traction on the chin and occiput. In all other locations noted above, Buck's extension is used. This treatment is continued until all pain and sensitiveness have disappeared. Then the affected part is immobilized in a plaster-of-Paris cast. The duration of cast treatment is subject to the condition of the patient. If after four weeks pain and sensitiveness have not ceased, a second cast is applied. Later a brace may be made to replace the cast.

The author uses also a 3 per cent solution of formalin in olive oil in joint cases where the trouble does not cease under treatment with local applications. The injection is made immediately before the cast is applied in order to immobilize the joint as quickly as possible.

Supplementary treatment consists of general systemic treatment, rest, diet, and elimination. Often, the author believes, auto-intoxication from intestinal putrefaction of animal proteins is the cause of chronic joint inflammations.

JOHN MITCHELL.

Gillette, A. J., and Chatterton, C. C.: *Mechanical and Surgical Treatment of Anterior Poliomyelitis. J. Lancet*, 1917, xxxvii, 691.

Anterior poliomyelitis, the authors state, should be the name applied to the disease under discussion. Infantile paralysis is a misnomer, for the disease is an affection of childhood and adolescence and is rarely ever seen nowadays in infancy.

The onset is atypical. Each case may present a different method of attack. There may be fever, peripheral neuritis, nausea, etc. Again, the disease manifests itself by paralysis at the onset.

The statement is made that the profession knows more and has discovered more in the care, prevention and treatment of anterior poliomyelitis than it knows of many other diseases in which the treatment does great good. Therefore, the plea of ignorance of the disease, of its origin and treatment cannot be excused.

The symptomatology is well known. The treatment is that of any other infection in its incidence. Rest and elimination are first to be considered. Massage and electricity also have an important place in the therapy, but these are inadvisable during the painful stage. Many deformities which result are due to the careless, ignorant, or indifferent attitude of the practitioner. Mechanical treatment alone prevents and even practically cures deformities which later would have to come to the operating table.

Surgery of anterior poliomyelitis at present deals only with the chronic stage. The success of each surgical procedure depends upon the location, action, and pathology of the part involved. The authors enumerate examples of operations on tendons for the correction of deformities. Tendon operations are especially valuable in foot deformities. Tendon fixation is meeting with great success. This operation consists of burying the tendon under the periosteum of the bone in a groove prepared for its reception. This operation is useful in flail conditions of the hand and foot. Tendon transference has resulted in remarkable corrections of deformities.

The principles of tendon transference are these: (1) to use muscles that have nearly the same physiological action as the paralyzed groups; (2) to establish muscle balance; (3) to correct deformity.

Foot deformities lend themselves best to this method of treatment. The authors mention several operations of tendon transference:

1. Transference of the extensor hallucis longus and the common extensors to the heads of the metatarsal bones for claw-foot, hammer-toe and foot-drop.
2. Transference of the tibialis anticus to the opposite side of the foot for equinovarus.
3. Transference of the peroneus longus into the tibialis anticus for talipes valgus.
4. Transference of the peroneus longus into the tendo achillis for talipes calcaneus.

Myotomy is replaced by mechanical stretching. The procedure of Soutter of Boston for marked lordosis of the spine, with the thighs on the abdomen, due to contraction of the iliopsoas, deserves mention. After an incision over the anterior superior spine, all the muscles attached to the crest of the ilium are loosened and the thigh brought down from its flexed position and held with plaster.

Bone operations are necessary only in extreme cases of deformity, the authors assert. Astragalectomy as advocated by Whitman for flail conditions is useful. Arthrodesis is used most often as an aid to other operative procedures. It is of value in chronic dislocations of the hip and shoulder.

JOHN MITCHELL.

Moxey, V.: *Recent Orthopedic Surgery*. *Practitioner*, Lond., 1917, xcix, 462.

In Pott's disease operative fixation of the spine is done to shorten the period of recumbency and to hasten the period of cure. The methods of Albee

and Hibbs have for their aim the production of ankylosis of the contiguous vertebrae. There is an element of risk in handling the patient while under the anæsthetic; the possibility of causing a fracture of the spine due to the pathological process must be considered. There is also danger of dissemination of the tuberculous process. Rutherford believes that children under five years of age should not be operated upon. Bradford holds that the splinting of a fractured spine by the bone graft, after the immediate symptoms are past, is a rational procedure.

The treatment of scoliosis by the various methods of support leaves much to be desired. Just as it is necessary to keep a club-foot for a time in an over-corrected position, so is it necessary to apply the same principle in the treatment of scoliosis. This, however, has not been found satisfactory or even possible.

In the surgery of paralysis due to injury, in complete or in most cases of non-improving partial paralysis, an inspection of the nerve is indicated. The nerve having been found and the fibrosed ends cut away, coaptation may be secured by flexion of the limb, by freeing and stretching the nerve, or by shifting it to a new and shorter course. The nerve is then sutured. The repaired nerve is wrapped in a tube of loose fat or autogenous fascia. If coaptation is impossible even after the nerve has been stretched, much may be done in the way of muscle and tendon transplantation, e.g., the biceps or semitendinosus may be inserted into the patella for a paralyzed quadriceps.

As regards bone grafting, the use of the autogenous bone graft in ununited fractures to fill a gap or to prevent displacement in certain difficult fractures is more in favor than the use of foreign bodies such as steel plates, screws or wire. The bone graft was also used to stabilize the ankle in infantile paralysis. The graft is cut in the shape of a bone peg and driven down through the lower end of the tibia, astragalus and os calcis. The results at first were excellent, but later failed, the ankle being freely movable.

In flat-foot, Soule claims good results from a combination of arthrodesis of the astragalus and scaphoid joints, with an autogenous bone peg driven through the scaphoid into the head of the astragalus. Silk ligaments are being less used than formerly, as the silk often acts as a foreign body and the irritation it produces necessitates its removal in many instances. Spasmodic club-foot, or the so-called hysterical club-foot, is usually a varus or equinovarus, associated with more or less vasomotor changes. It is very obstinate to treatment, forcible treatment and electricity making the condition worse. As to therapy, the gentlest measures, such as warm baths and light massage, are best.

In congenital dislocation of the hip, there is no improvement over the present bloodless method of reduction, and Galeazzi claims 84.46 per cent of cures in a series of over 1,000 cases. These were cases of children under the age of four.

J. J. KURLANDER.

SURGERY OF THE SPINAL COLUMN AND CORD

Henninger, C. H.: Cord and Nerve Affections Causing Low Back Pain. *Am. J. Orthop. Surg.*, 1937, xv, 844.

Pain may be present and severe in spina blanda when the cord proper or cauda equina is anchored by adhesions in or around the sac. The pain is caused by a stretching or irritation of the nerve-roots, when the relative position of the cord and vertebrae is changed by their unequal rate of development. Sclerosis of the blood-vessels supplying the posterior ganglia is a cause of severe pain. Spinal meningeal hemorrhage causes severe pain in the back, with sudden onset, and there is spasm of the back muscles. Hemorrhage into the substance of the cord, if large, causes a sudden and severe pain and is followed rapidly by symptoms of myelitis. In pachymeningitis externa spinalis the pain symptoms are those of sensory root irritation or compression. The pain symptoms of acute spinal leptomeningitis often persist long after the acute stage has subsided.

In the early stages of acute poliomyelitis there is a generalized hyperaesthesia with back pains, the pains radiating to the parts subsequently paralyzed. In syringomyelia with curvature of the spine, low back pains are common following exertion. Tumors of the vertebral column, membranes and spinal cord produce local back pains which are intense, and there may be motor irritation associated. In caudal neuritis the symptoms are similar to caudal tumor. Syphilitic processes may involve any or all of the structures under consideration and may simulate any of the above nerve conditions, but as a rule low back pains are not common in syphilis.

In tabes dorsalis the girdle pains are of some diagnostic value. In multiple neuritis, pains in the back are often an early symptom, although pains are not usually common in this condition. Neuromata of the peripheral nerves in the lumbar region are an occasional cause of pain. Varicose veins in the lower portion of the meningeal sac and calcareous deposits on the inner surface of the spinal dura are among the rarer causes of pain.

Pains in the back due to injury require special consideration. There is persistent severe pain which is increased on motion. There is also rigidity of the spine and tenderness on pressure. Low back pains in this type may readily come from a state of exhaustion. The term sciatica is limited to a primary involvement of the sciatic nerve and the pain is the result of a neuritis. In addition to the pain there may be anesthesia, muscular atrophy, electrical reaction of nerve degeneration, with loss of tendon jerk. This may be due to injury, continuous pressure, a fall on the buttock, severe muscular exertion, chronic intoxication, infections, diabetes, etc. The most severe back pains are seen in diseased

processes causing pressure on a nerve-root. Rest is indicated and is possibly the best treatment for inflamed nerve conditions. J. J. KURANSKY.

Myers, T. H.: The Bone Graft in Tuberculous Disease of the Spine. *Internat. J. Surg.*, 1937, xxx, 347.

The bone graft in tuberculosis of the spine is simply a mechanical device to secure more complete immobilization of the diseased vertebrae. The author asserts that the immobilization, however, is not complete, as the articular surfaces and bodies of the vertebrae are not held, but that only the spinous processes and the lamina to some extent become fused. He concludes that lateral support should be continued for a long time as a postoperative measure until the adjacent tuberculous surfaces may become consolidated. To the lack of such support the author believes may be attributed the cause of relapse.

From his observation of sixteen cases he concludes that bone grafts in adults last longer than in children. In some cases the graft fused with the vertebrae. He does not use the lateral splinting chips, since in one case it pierced the skin and had to be removed, and in another it remained unattached for a long time, causing pain and discomfort.

The author advises taking an X-ray of the bone from which the graft is to be taken in cases of multiple osteomyelitis, since, while the bone may appear normal to the naked eye, upon X-ray it will show foci of involvement.

The author made a study of a large number of cases of Pott's disease with paraplegic symptoms to determine the probable duration of these symptoms in cases treated with braces and rest in bed. The cases in the midorsal region were paralyzed on an average of nine and one-half months, while in those cases which were operated upon the period of paraplegia was shortened.

The results in the sixteen cases operated upon were as follows: one patient died from status lymphaticus; one patient died from an abscess connected with multiple foci of osteomyelitis; three patients showed more improvement than would probably have taken place without the operation; eleven cases were either cured or showed very much improvement.

The operation is indicated in fracture of the spine without symptoms of injury to the cord. Cases of this kind develop deformity weeks or even months after an injury. The delayed union is due to the small size of the fractured parts, which makes immobilization impossible. The author concludes that this operation will appreciably shorten the period of Pott's disease, and diminish the amount of existing and probable deformity at very little operative risk. M. A. BERNSTEIN.

SURGERY OF THE NERVOUS SYSTEM

Soulttar, H. S.: *Some Points Arising in Nerve Injuries*. *Brit. M. J.*, 1913, II, 817.

This paper is founded upon an experience of 200 cases observed at one of the English base hospitals. The injury has been a primary one in every case, i. e., either the direct and immediate result of the wound or some supervening condition such as an aneurism or of some necessary surgical interference. The widespread belief that many nerve injuries are secondary to inclusion in fibrous tissue or callus must be abandoned. The nerve may be completely severed with the formation of end-bulbs or a portion only may be replaced by fibrous tissue, but even in the latter case careful examination will show that some fibers at least were totally severed. That spontaneous recovery may occur is explained by the fact that one-third of the fibers of any nerve may be destroyed without any permanent loss of function. The injury being primary, suitable treatment should be begun early, and much can be done by preventing contracture, keeping muscles in good condition and keeping joints free so that favorable conditions are present when the time comes for the nerve to regenerate.

The area of analgesia will be a little less than that of pain. Occasionally one finds exquisite sensitiveness instead of anæsthesia. This indicates an interstitial neuritis and insufficient injury to the nerve to destroy its conductivity. A knowledge of the cutaneous areas supplied by the ulnar, median, and musculospiral nerves in the upper and by the external and internal popliteals in the lower extremity suffices for at least 90 per cent of the cases. Accurate charts of the area of anæsthesia must be kept and checked every few weeks, for the signs of recovery are very slow to appear. The most marked trophic disturbance is a glossiness and dryness of the skin with occasional increase of sweating. The skin is cyanosed or deep red in color, actual ulceration usually being due to accident. Deeper tissues undergo atrophy, even the bones losing their lime salts. These trophic changes are most marked in partial and irritative lesions where they may be accompanied by excruciating pain of an intense burning nature and a tenderness so severe that the slightest touch is intolerable. It is not easy to ascertain the extent of diminution or total loss of voluntary power in the muscles supplied by the nerve. This is the result of other groups of muscles imitating the action of the paralyzed ones, or the pain of a fracture may render totally inactive a group of muscles which are really intact. One must be familiar with the action of the muscles supplied by each of the principal nerves of the arm and leg. The electrical reactions can be elicited with a small induction coil and a few cells. The first symptom of beginning recovery is quickening of the characteristic slow undulatory contraction after galvanic stimulation.

A nerve injury overshadows every other in importance. Splints must be applied so that paralyzed muscles are relaxed and joints placed in the position in which they are most useful when ankylosed. Physical treatment must be carried out under supervision of an experienced staff. Massage, passive exercise with the Zander apparatus, whirlpool baths and electricity form the most important portion of the treatment unless operations are deemed necessary. The principle of the whirlpool bath is that the limb is surrounded by a stream of rapidly moving water at about 110° F. It accelerates the blood flow while gently massaging the limb, the limb after twenty minutes showing a remarkable relaxation of the contracted muscles and ligaments.

The sinusoidal and galvanic currents are the only ones employed in the electrical department. In the intervals between treatment every effort must be made to keep the paralyzed muscles relaxed, the limb warm, the atrophic skin protected from injury, and to prevent the development of contractures.

Operation should only be done at least six weeks after all danger of sepsis is past. The fibrous tissue is removed until nerve fibers can be plainly seen. Catgut sutures are used to approximate the ends. The author prefers a long incision because it may be very difficult to find the nerve-ends at all, and first isolates the nerve on both sides of the damaged portion. Usually this wide mobilization of the nerve enables one to unite the ends by direct suture. In the case of the sciatic a gap of three inches can be overcome by flexion of the knee. Where there is a large gap, there is usually a large end-bulb on the proximal end. He turns down a flap as far as the bulb, which forms a sort of hinge. The terminal half of the bulb is now amputated and the raw surface is folded over itself and sutured. In this way the living fibers are preserved to almost their extreme point and a living scaffold is formed for their downgrowth. The results of this method have been most gratifying.

For other cases it is best to use a radial nerve as a graft for bridging a gap. It is of small diameter and its removal leaves as a rule no disability. Autogenous grafts are preferable to catgut or animal nerve.

D. N. EISENDRATH.

Durocex, E., and Couvreur, A.: *An Experimental Contribution to the Study of Division and Functional Restoration of Nerves*. *Med. Press & Circ.*, 1917, CIV, 364.

The results of a series of experiments on dogs are reported, so arranged and carried out that they are made available for elucidation of the unsolved problems of nerve restoration.

The conclusions arrived at are as follows:

1. From the motorial viewpoint the dog does not behave as does man. Division of even important

nerves, such as the great sciatic or the external popliteal, is not followed by troubles of locomotion except slightly marked and transitory ones.

2. The idea of the possibility of immediate restoration of the functions of a divided nerve is purely illusory. Restoration after long periods of intervening failure are the only real ones. In those cases in which such have been definitely established, physiology has demonstrated, and the fact has been corroborated by histologic observations, that the peripheral segment does not regain its functions until after it has been penetrated by the axones of the central one.

3. In cases of complete division of a nerve-trunk, it is necessary to have recourse to suture, and sometimes to grafting, when there has been extensive loss of substance.

4. It is necessary to free a nerve-trunk when it has been subjected to compression by proliferation of connective tissue. Such proliferations interfere with the functions of the nerve involved and also threaten the functions of the other nerves of the limb.

E. B. FRIEDICH.

Thomas, J. J.: *Neurologic Indications for and Against Operations in Traumatic Injuries Affecting the Central Nervous System.* *Boston M. & S. J.*, 1917, clxxvii, 503.

In a review of the surgery of the central nervous system, Thomas emphasizes the following points:

Cases of dislocation or fracture-dislocation of the spine in all regions without signs of injury of the cord simply require fixation of the spine.

It is useless to operate in cases of complete transverse lesion of the spinal cord, unless it is found impossible to prevent slipping of the fragments by any other method.

Where there is compression of the cord by fragments of bone, operation is indicated at once.

Depressed fractures of the vault of the skull if compound should have loose fragments removed or elevated. If simple, with depression of the inner table of the skull or signs of injury to the brain beneath, operation should be done. As a rule little should be done beyond the removal of the blood-clot and the relief of intracranial pressure.

In bursting fracture of the skull, which is in the nature of a fissure, often multiple, running to the base of the skull, if associated with gradually increasing intracranial hemorrhage, whether due to rupture of the meningeal artery, basal or other sinuses, operation is demanded for relief of the hemorrhage.

Intracranial pressure demands relief by operation in cases with deepening unconsciousness, slowing of the pulse, blurring of the outline of the optic discs, and steadily rising blood-pressure, or an increasing pressure of the cerebrospinal fluid.

On the other hand, widespread laceration of brain tissue from hemorrhage into the cerebral substance is influenced but little in its course by operation. The most reliable signs of this condition are fixed, rigid pupils, most often dilated, which show no reaction to light, and steadily rising temperature, which in the absence of infection is the most reliable sign of extensive destruction of cerebral tissue. It is hardly necessary to add that the presence of profound shock is always a contra-indication to operation.

The author states that one should guard against advising operation in cases of apoplexy or intracerebral hemorrhage which in falling have received an injury of the head.

He mentions still another class of cases of fracture of the skull in which operation is of value. These are the cases in which there was no paralysis and no definite reasons for operation, either exploratory or decompressive, and where the patient improves up to a certain point and then shows a persistent mental slowness, perhaps with irritability. In the few cases where he has advised opening the cranial cavity, he found a dura with an organizing blood-clot adherent. Marked and rapid improvement in mentality followed almost immediately the removal of the clot or the lessening of the tension by opening the dura when the clot was not accessible.

In deciding in favor of operation in fracture of the skull, one should always have in mind that the most important object aimed at is the relief of the increased intracranial pressure, no matter to what it may be due.

G. W. HERRICK.

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESSSES, ETC.

Symmers, D.: *Acute Lymphatic Leukæmia and Lymphatic Leucosarcoma; Lymphatic Leucosarcoma; Anthrax; Acute Syphilitic Glomerulonephritis; Acromegalic Giantism.* *Internat. M. J.*, 1917, xxiv, 1293.

Among 5,600 necropsies performed at Bellevue Hospital in the past eleven years, there were 3 cases

of lymphatic leukæmia, and of this number 5 were of the chronic variety and 3 acute. Acute lymphatic leukæmia is of great clinical interest, especially with reference to the possibility of an infective origin, and also as bearing upon a rare and apparently little known disease described by Sternberg under the title of leucosarcoma. The author details three cases of acute lymphatic leukæmia.

The term leucosarcoma was introduced by Sternberg to indicate a disease characterized by the pres-

ence in some part of the body of a definite tumor composed of lymphoid cells which are eventually poured into the blood in such numbers as to constitute a true leukemia. Two varieties of leucosarcoma are recognized; one in which the original growth is made up of cells of the lymphocytic type, the subsequent infiltration of the blood representing a variety of lymphatic leukemia; and a second, in which the original focus is composed of myelocytes, the discharge of which into the blood gives rise to leukemia of the myelogenous type.

The recognition of lymphatic leucosarcoma depends upon three factors: first, the existence of a tumor which, upon microscopic examination, reveals the histologic picture of a lymphosarcoma, the cells, contrary to the usual arrangement, consisting almost exclusively of large lymphocytes with an admixture of small cells; in occasional instances, however, this order is reversed. Secondly, the original focus of growth may exist for weeks, months or years before invasion of the blood stream occurs, but involvement of the blood, when it does take place, is abrupt and the disease then progresses with extreme rapidity. Thirdly, the disease is accompanied by enlargement of the spleen, the lymph-nodes in various situations, the liver, kidney, etc., due to diffuse infiltration of lymphocytic cells to or their presence in circumscribed collections; in short, the disease, as its name implies, is a variety of lymphosarcoma with leukæmic transformation. The author details a case of lymphatic leucosarcoma.

Among animals, geographically as well as zoologically, anthrax is the most widespread of all acute infective diseases. In recent years the occurrence of anthrax in human beings has undergone a notable increase and it is now regarded by students of industrial conditions as an occupational disease of moment. In general hospital work anthrax is commonly regarded as a rare disease. The prognosis of anthrax depends upon several factors, and the mortality varies within rather wide limits; for example, the malignant anthrax oedema of the face and neck is invariably fatal, largely because of infiltration of the soft tissues around the larynx, pharynx, and œsophagus. In the same way the wool-sorter's disease, which is an anthrax septicæmia with intense pulmonary and cerebral symptoms, and anthrax of the intestinal tract, are likewise deadly. The malignant pustule, on the other hand, not infrequently heals and the patient recovers. In the case of malignant pustule of the face, however, the mortality is five times greater than that of an extremity, in which only about 5 per cent of cases terminate fatally.

There are several points in the pathology of the anthrax pustule that are of practical value in determining the method of treatment. At the outset the malignant pustule is essentially a localized lesion and the causative micro-organisms are confined within a limited zone, at least for a time, invasion of the blood occurring as a late event. If taken sufficiently early, therefore, excision of the pustule

offers the best chance of recovery. At the same time, it is unwise to incise the oedematous tissues in the immediate vicinity of the pustule, for the reason that the gelatinoid infiltration, the so-called anthraco-mucin of the lymph-spaces, is of the nature of a protective mechanism; in the oedematous area the anthrax bacillus is rarely to be found. Incision, therefore, not only does not drain the affected region of inimical bacteria, but is actually harmful, opening the way to secondary infection and breaking down a barrier to the spread of existing infection.

The specific anti-anthrax serum of Sclavo is said to have reduced the mortality to a marked extent. More recently still, the government authorities in the Argentine have been using normal bovine serum intravenously in large doses, and it is said that the results are even more favorable than from the use of specific antiserum. The author reports two cases of malignant pustule occurring on the chest wall.

In early secondary syphilis, transient irritation of the kidneys is not uncommon. On the other hand, syphilis is sometimes the cause of acute inflammatory changes in the kidney of such nature and extent as permanently to disable the kidney or even to cause death; in bedside work and in the experience of the necropsy room, acute syphilitic nephritis is exceedingly rare. In the case detailed by Symmers, death occurred after a brief illness, and the changes in the kidney were of the same type as those encountered in the acute nephritis of scarlatina.

Hyperactivity of the anterior lobe of the pituitary coming on before the completion of epiphyseal ossification results in giantism; that is to say, the individual is overgrown, but well-proportioned. After epiphyseal ossification is complete, however, hyperactivity of the hypophysis results in acromegaly with or without giantism. That the relationship between acromegaly and giantism is close is shown by the fact that a considerable percentage of acromegals are giants, and that a still larger percentage of giants develop acromegaly.

The pathologic changes in acromegalic giantism may be grouped as follows: (a) changes in the bones and cartilages; (b) enormous increase in the size of certain viscera, notably the heart, lungs, liver and spleen; (c) atrophy of the genitals; (d) disease of the pituitary, such as adenomatoid hyperplasia, replacement by syphilitic or tuberculosis granulomata, cysts, hemorrhage, etc.; (e) finally, acromegaly is not uncommonly attended by changes in the ductless glands other than the pituitary. Status lymphaticus is sometimes recognizable in acromegalic subjects. Acromegaly usually begins in the third or fourth decade. It is rather more frequent among men than women. Heredity appears to play a rôle. For example, it has been observed in both parents and a child, in father and son, in father and daughter, in mother and daughter, and, in the case outlined by Symmers, in two brothers. The author describes in detail the necropsy findings in his case of a Lombardy giant of 8 feet and 10 inches.

P. G. SKILLERN, JR.

Giffin, H. Z.: Observations on the Treatment of Myelocytic Leukemia by Radium. *Boston M. & S. J.*, 1917, *clxxvii*, 486.

The main points are given in the author's summary as follows:

1. Thirty consecutive cases of myelocytic leukemia were treated by means of the surface application of radium element over the enlarged spleen. A dosage of 50 and 100 mg. was used. The protection finally adopted was 2 mm. of lead and 2.5 of an inch of wood. The splenic area was mapped out into squares after the manner described by Ordway, and the radium was applied over each square for from two to four hours, with a total exposure usually of twenty-four or thirty-six hours. The exposures were repeated every week until a satisfactory remission was obtained.

2. A certain degree of general improvement, together with reduction of the size of the spleen and of the leucocytic count, occurred in every instance, even in the most advanced and toxic cases. Marked temporary improvement occurred in 26 patients, and a remarkable improvement in 13. It is impossible satisfactorily to discuss the subsequent histories of these cases at this time.

3. Hemorrhage ceased as a rule after one or two series of exposures. In two instances, hemorrhage occurred after radium exposures when it had not occurred previous to treatment. In these instances the hemorrhage seemed to be the result of over-exposure. An anemia also developed; both the hemorrhage and the anemia were successfully combated by means of transfusion.

4. In 25 patients there was definite improvement of the anemia concomitant with the improvement of the general condition. The reduction of the number of leucocytes was chiefly due not only to an absolute but also to a striking relative fall in the myelocytes; there was a striking fall in the absolute count of polynuclears, while their relative percentage remained approximately the same. There was also a marked fall in the absolute count of small lymphocytes.

5. Surface exposures of radium over the spleen of myelocytic leukemia usually effect a very rapid reduction of the size of the spleen, a fall of the leucocyte count, improvement in the general condition and, together with transfusion, constitute at present the most effective temporary measure in the treatment of the disease. ADOLPH HARTUNG.

Hull, A. J.: The Paraffin Treatment of Burns. *Bost. M. J.*, 1917, *li*, 743.

Various preparations of paraffin have been made under the author's direction containing acriflavine, brilliant green, chloramine-T, etc., dissolved in the paraffin base. Another direction in which the new antiseptics have been given scope for improvement has been the treatment of the burn by an antiseptic before the application of the paraffin. The results following this modification have been so satis-

factory that it has been adopted as a routine method.

The burn is first washed with normal saline; 1 in 1,000 acriflavine solution or proflavine has now been substituted. The burn is dried with gauze or the electric drier. A layer of paraffin is painted over the burn, being applied at a temperature of 50° to 60° C. A thin layer of wool is placed over the first layer of paraffin and a second layer of paraffin at the same temperature is painted over the wool. A dressing of wool and bandage is applied over the paraffin dressing and the dressing changed every twenty-four hours. It is important to paint or spray on a sufficiently thick layer of paraffin. If the temperature of the paraffin is too high the layer is apt to be too thin. The efficacy of this treatment depends largely upon the mechanical effect of the paraffin, the epithelium being conserved from damage, and the tissues held at rest by the splint-like action of the dressing.

The addition of antiseptics to the paraffin preparation gains better results than preparations without antiseptics. The first antiseptic to be extensively used was eucalyptus oil, which, in conjunction with beta-naphthol, is still used in No. 7 paraffin.

Scarlet red paraffin has given satisfactory results in general use. Burns which have been treated with No. 7 paraffin occasionally become sluggish and present unhealthy granulations, it was therefore changed to scarlet red paraffin. The burns have become clean and show a tendency to heal, the result is great acceleration in healing.

Flavine paraffin has given very satisfactory results. Paraffin preparations of brilliant green and chloramine-T have not been satisfactory, the antiseptics being difficult to incorporate in the paraffin. The results of acriflavine applied in the form of solution followed by the application of No. 7 paraffin have been so good that the use of special preparations has been discarded with the exception of acriflavine paraffin and scarlet red.

The effect upon recovery of the application of various antiseptic solutions previous to the application of the paraffin has been studied. Eusol accelerated the cleaning of the burn but was too irritating. Brilliant green also accelerated cleaning the burn but caused unhealthy granulations. Acriflavine cleans the surfaces well and produces a healthier type of granulations. Scarlet red is only used, in 10 per cent solution, when the burns are clean and require stimulation.

The most satisfactory treatment has been the preliminary painting of the surface of the burn with aqueous flavine solution, 1 in 1,000, followed by the application of No. 7 paraffin. In cases of long duration scarlet red, 1 per cent, is substituted for the flavine solution.

The formula for Paraffin No. 7 calls for: resublimed beta naphthol, 0.25 per cent; eucalyptus oil, 2 per cent; olive oil, 5 per cent; vaseline, 25 per cent; paraffinum durum, 67.75 per cent.

V. C. HUNT.

Macleod, N.: A Preliminary Note on X-Ray Detection of the Presence of Cloth in Wounds. *Brit. M. J.*, 1917, ii, 191.

This preliminary report is based on the discovery, by means of a stereoradiogram, of a piece of reed *in situ* in a leg after injection of bismuth emulsion into a sinus leading to it; it had not been detected by a similar examination made prior to the injection. It is believed that pieces of cloth in fresh wounds, or old ones that refused to heal, can be similarly demonstrated. To substantiate this contention, the author thrust a piece of khaki cloth into the interior of a lump of ox liver, injected it similarly to the above and was able to distinguish clearly the texture of the cloth. ADOLPH HARTUNG.

Duane, W.: Methods of Preparing and Using Radio-Active Substances in the Treatment of Malignant Disease, and of Estimating Suitable Dosages. *Boston M. & S. J.*, 1917, cxcvii, 787.

This report is from the Huntington Hospital, Boston, where about five hundred new cases of malignant disease are seen each year.

Radium belongs to the group of metals, but is unstable to a certain degree in that it is transformed into another substance, a chemically inert gas, called radium emanation. It would require 1,700 years for half a given quantity to disappear. The emanation transforms itself into a substance called radium A, half a given quantity of emanation disappearing in 3.85 days. Radium A changes into radium B, half of A changing in 3 minutes; B changes into C, half disappearing in 26.8 minutes; C changes to D, half disappearing in 19.5 minutes, and so on up to radium F, which is the last in line and known as polonium, and which was the first to be discovered. Radium A, B and C, etc., deposit themselves on anything with which they come in contact and are known as "deposited activity."

By radio-active substances is meant substances that continuously emit peculiar types of invisible rays that differ substantially from light and heat rays. The radiation, if sufficiently intense, destroys tissues. Radium C produces by far the most penetrating rays. Radium tubes are not used until the rays have had a chance to penetrate the walls of the container and the radium is then only used to produce a certain amount of emanation, and this in turn A, B, and C. The deposit of radium B and C can be obtained as follows:

1. The emanation may be extracted from the radium and pressed into a glass or metal container of any desired shape and size, and the radium A, B, and C allowed to accumulate. The emanation if left in the tube prolongs the activity time, but does not add to the penetration.

2. Radium A, B, and C may be deposited on sheets of metal or other substances by leaving them for several hours in contact with the emanation.

3. Radium A, B, and C may be dissolved in water, either by dissolving the purified emanation

or by depositing the radium A, B, and C on grains of salt, for instance, and dissolving the salt in the liquid. A large amount of activity can be put in a few drops of liquid and this injected into the blood stream.

The apparatus described includes:

1. A system of glass tubes and reservoir for purifying the radium.

2. Tubes and containers for the radium.

3. An instrument for accurately measuring the quantity of the radio-active substance in the application on the tissue.

4. An instrument for roughly and rapidly estimating the quantity of radio-active substances in tubes and applicators.

5. An instrument for detecting the presence of radio-active substances. This is used in finding lost tubes and determining if tubes previously used are intact.

The unit of measurement of radium is the curie, which is the quantity of emanation in equilibrium with one grain of radium element.

One of the advantages of using the emanation instead of the radium is that it can be put into much smaller tubes and a greater variety of size and shape can be obtained.

Gauze is at times wrapped about the applicators, as it cuts off the secondary radiation coming from the surface of the lead, which is not very penetrating and would cause irritation, and it raises the applicator up from the surface of the skin, thus reducing the amount of radiation absorbed in the skin as compared with the amount absorbed at a distance below the surface.

The following cases are reported:

1. Epidermoid carcinoma recurring after operation. Small glass tubes containing from 1 to 9 millicuries of radium emanation were inserted and remained in place from ten days to two weeks.

2. Epidermoid carcinoma. Glass tubes were inserted through a trocar into the tissues. An emanation from 2 to 10 millicuries was used, remaining in place about two weeks at a time. During the later part of the treatment steel tubes containing 15 to 34 millicuries were used. At the end of the treatment microscopic examination showed no evidence of new-growth.

3. A case of keratosis, widely distributed. Glass and steel tubes were used, the glass tubes for two or three weeks, and the steel tubes from one-half to one and one-half hours. Emanation varied from 14 to 47 millicuries.

4. Superficial carcinoma of the breast. During three years the patient received 64 treatments of emanation, varying up to 142 millicuries, lasting from one to three hours.

5. Sarcoma of the face. In 10 months 22 treatments were given, varying up to 59 millicuries.

6. Malignant lymphoma. Gamma rays only were used. The dosage was from 31 to 550 millicuries, with an exposure of from 8 to 48 hours, a total of 93,756 millicurie hours.

7. Myelogenous leukemia. A marked reduction in white blood-cells and the size of the spleen followed.

All the cases treated above showed very satisfactory results.

C. A. BOWEN.

Brookover, C.: The Peripheral Distribution of the Nervus Terminalis in an Infant. *J. Comp. Neurol.*, 1917, xxviii, 347.

This discussion is based upon the study of two series of sagittal sections of stillborn negro infants at about full term. The tissue was prepared by Huber and Guild's modification of Ransom's pyridine silver method.

The author summarizes his work by saying that the peripheral nervus terminalis is so large in man that it may be said to be hypertrophied as compared to the known development in other mammals, without appreciably increasing its central root.

In addition to many cells in the ganglion terminale it contains about fifteen hundred cells peripherally under the nasal mucosa. Though disposed in three or four chief rami emerging from the lamina cribrosa, there is a vast network of interlacing bundles deep to the main arteries. Some of the fibers trail over the walls but the method of treatment by the pyridine silver technique does not reveal the ultimate endings. There is considerable evidence that the interlacing rami of the nasopalatine nerve send a bundle of fibers of considerable size through the cribriform plate to establish a sympathetic chain connection posteriorly by way of the sphenopalatine nerve and ganglion.

M. M. MILLER.

Erlanger, J., Gesell, R., Gasser, H. S., and Elliott, B. L.: An Experimental Study of Surgical Shock; a Preliminary Report. *J. Am. M. Ass.*, 1917, lxxx, 2089.

The methods used in producing shock were the following:

1. Exposure and manipulation of the abdominal viscera. Evisceration did not hasten shock development, nor did the removal of the abdominal sympathetic chain and section of the splanchnic nerves some weeks prior to the experiment.
2. Partial occlusion of the inferior vena cava.
3. Occlusion of the thoracic aorta.
4. Injection of epinephrin until the peripheral flow was almost zero.
5. Plugging the portal radicles to the liver.

The authors conclude from the procedures that processes are started peripherally that eventually lead to shock; that the abdominal area is scarcely more potent in shock production than other parts of the body of comparable vascularity; that the sole primary disturbance leading to shock is not the retention of blood in the veins and capillaries of the splanchnic area nor failure of the vasomotor center; that the reduced pressure is to be attributed to a reduction in the effective volume of blood; and that this pressure reduction is accomplished by reducing

for some time the blood supply to a considerable part of the body.

The authors develop from the above conclusions the following working hypothesis:

Continued deficient blood supply starts a more or less extensive reaction, possibly of the nature of an inflammation in which engorgement of the small veins and capillaries and transudation of the plasma are two of the early consequences. If acidosis occurs, might not it be the result of deficient oxidation which the deficient blood supply undoubtedly has in its train? Under the influence of the low blood-pressure of shock, the heart, while still capable of considerable exertion, has not the normal reserve, the vasomotor center does not respond so quickly to reflex stimulation, and the respiratory center is working very close to the limit of viability.

The causative factor of shock may be a reduced circulation brought about possibly by the action of pain stimuli on the vasomotor mechanism, together with a certain amount of hemorrhage. However, a peripheral constriction either by direct or reflex stimulation of the vasoconstrictor center has not as yet been successful in producing shock experimentally.

H. J. VAN DEN BERG.

Mixer, S. J.: Some of the Unsettled Problems in Surgery. *J. Lancet*, 1917, xxxvii, 759.

In using the Carrel-Dakin treatment, the directions of those who have studied the method should be followed implicitly before making improvements and changes.

The discussion on cholecystostomy versus cholecystectomy has not been settled, but all agree that drainage is much safer in the hands of an inexperienced surgeon and that certain desperate cases must be drained if they are to be saved. The value of excision over gastro-enterostomy and vice versa in duodenal ulcer has not been agreed upon. The fact that cancer in this region is due to previous and long-continued benign ulceration would lead one to believe that in all cases where the ulcer has existed for a considerable period of time, excision is the most radical method of cure, as it is absolutely impossible to examine microscopically all such ulcerations at the time of operation. The greater mortality from pylorotomy, however, makes many operators prefer the simpler operation of gastro-enterostomy.

The surgery of the large intestine has been and is a fruitful topic of discussion, though a reasonable solution is nearer at hand than it was a few years ago. Cancer in the intestinal tract can be radically cured in certain cases. The results now obtained in resection of the large intestine, the rectum and the stomach for cancer are far beyond what could have been hoped for a few years ago, owing to the progress in the operative methods, including the avoidance of shock and deaths from anesthesia.

Cancer of the mouth and tongue is now being largely removed by the cautery instead of the knife, with increasingly good results. Serum therapy has

given some definite results and should be tried in all cases of sarcoma, inoperable or postoperative, but this treatment in the more common infections is still far from being sure or upon a scientific basis. Radio-active rays misused have sacrificed thousands of lives; but these rays have also brought infinite relief and sometimes cure when used in proper cases and in a proper manner.

One of the most important problems is the care and rehabilitation of the vast army of men who will return from the war crippled, deformed, blind and disabled on account of injury, exposure, or poison gases. Care of the soldier will result in greater care in the treatment and subsequent training of those injured in civil life.

E. B. FREILICH.

SERA, VACCINES, AND FERMENTS

Shields, C. L.: A Complement Fixation Test for Tuberculosis. *Northwest Med.*, 1917, xvi, 364.

Shields discusses a complement fixation test for tuberculosis that he considers very valuable.

The antigen used in the test is prepared by grinding many different strains of the tubercle bacillus in sodium chloride. This detects on active antibody specific to tuberculosis. This antibody is not found in normal individuals nor in individuals with healed tuberculous lesions, but only in those with active tuberculosis.

In a large series of patients the results, as recorded by Miller and Zinsser, showed a positive reaction in 96 per cent of all active cases and a negative reaction in all non-tuberculous and normal patients. It was also negative in cases of arrested tuberculosis.

In a series of 100 serums tested by the author, there were 9 positive reactions in 56 syphilitic serums, and 8 known tuberculous serums gave negative results. Of 23 cases presenting no definite signs, but suspected as being tuberculous, 12 were positive and 11 negative.

JOHN W. TURNER.

Archibald, R. A.: A Review of Some of the Later Developments Along Immunological Lines. *Calif. St. J. Med.*, 1917, xv, 464.

The article is a condensed technical review of the recent developments along immunological lines, deductions from which the author applies to the phenomena exhibited in infectious diseases. While it is admitted that the clinical manifestations of a disease are such that the source of the toxic element can frequently be designated, yet the clinical symptoms of many different types of infection and toxæmias are so similar that other factors which are of equal importance must not be overlooked. The toxin or toxins of an infectious organism are not solely responsible for the pathological changes seen in the tissues during the progress of an infectious disease.

The author cites tuberculosis, typhoid, and pneumonia as types of infectious diseases characterized by great productive changes or cellular prolifera-

tion. The number of new cellular elements formed during the course of these diseases may equal the number of specific organisms present. The toxins and end-products of the metabolism of these newly formed cells are as much of a tax upon the patient as the toxins evolved from the bacteria.

Specific treatment therefore aimed at the production of immunity does not provide for the neutralization of the toxic end-products which are the result of parenteral digestion of the individual's own serum and tissue proteins. Specific antibacterial preparations, accordingly, no matter how efficacious in the destruction of bacteria, cannot in themselves be self-sufficient in the treatment of infectious diseases.

ELLIS FISCHER.

BLOOD

Minot, G. R., and Lee, R. I.: Treatment of Pernicious Anæmia, Especially by Transfusion and Splenectomy. *Boston M. & S. J.*, 1917, clxxvii, 761.

The authors have made a careful study of 96 cases of pernicious anæmia seen in the past three years. Before discussing the treatment proper of pernicious anæmia, differential diagnosis, blood destruction and blood formation, red cell destruction, bone-marrow stimulation and bone-marrow threshold are considered in reference to the rôle each plays in the effect of treatment.

In discussing various types of the disease, the authors state that the effect of therapeutic procedures will ultimately depend upon the reserve power of the marrow and the degree of erythrocytic destruction. On account of the natural tendency to remission in true cases of pernicious anæmia it is difficult to judge benefits directly attributable to therapeutic measures. The worst cases are those with marked pouring out of all marrow elements, while those that are usually most affected by therapeutic measures are the types which frequently do well spontaneously.

The authors recognize the following five classes which often merge one into the other:

1. Acute cases terminating fatally in a few months, with varying degrees of blood destruction.
2. Cases characterized by marked or fair remissions, from one to fifteen in number, usually with considerable hæmolytic which is more marked in relapses and sometimes not abnormal during remissions.
3. Cases with a considerable degree of hæmolytic, chronically present, with slow and never very striking remissions, also, except terminally, without very serious relapses. This class is also usually characterized by an enlarged spleen. The condition resembles acquired hæmolytic jaundice and is more favorably affected by splenectomy than by other forms of treatment.
4. Distinctly chronic cases that slowly become worse with very mild remissions.
5. Continuously chronic cases that very slowly grow worse usually with no remission and associated

with slight increased red cell destruction and a sluggish inactive marrow.

It was the experience of the authors that cases with enlargement of the spleen and liver ran a more favorable course than those without such enlargements. These cases did well as a rule after splenectomy.

Regarding general treatment and the use of arsenic, the authors lay stress upon the importance of general measures, such as rest in bed, freedom from mental worry and strain, etc., which are clearly indicated since they prolong life and help to cause remissions. The exact effect of arsenic upon bone-marrow or the destruction of red cells is still undetermined. The authors are inclined to believe that it has no especial influence, but they see no harm attributable to its use.

They made 115 observations upon the effect of treatment by transfusion and splenectomy. Transfusions have been used in relapses to relieve symptoms and with the hope of bringing about a remission. They have been given every three to seven days, in comparatively small quantities, or one to three times seven to fourteen days apart. Much space is devoted to the results obtained in the cases in which transfusion was used, together with indications for its use.

The authors found that though a more profound change in the blood picture occurs after splenectomy than by any other means, yet the results have not been as great as was first expected, and are in no way to be compared to the marked improvement from this procedure in hemolytic jaundice. Clinically the patients in whom splenectomy acts favorably show quite rapidly improvement in looks and feelings. The red count and hemoglobin may rise rapidly or the rise may be delayed for from three to six weeks; improvement in the general condition may be seen some time before the improvement in the blood picture is noticeable.

Seventy-five per cent of all reported cases following splenectomy have shown definite improvement for three months, which has continued for six months in 65 to 70 per cent of the cases; remissions of more than a year are probably between 10 and 30 per cent. The operative mortality of reported cases is about 15 per cent; the authors claim that with better technique and in selected cases it should be from 3 to 5 per cent.

In the selection of cases for splenectomy those of the more hemolytic types of the disease, especially those with enlarged spleens, usually do well. The rarer cases with chronic blood destruction and active marrow, with no increased fragility of the red cells to salt solutions, derive more benefit from splenectomy than appears spontaneously.

If transfusion has benefited a patient, splenectomy almost always will cause greater improvement; no improvement from transfusion does not always mean that there will be no benefit from splenectomy. With hemoglobin below 30 per cent and the red count about 1,500,000, the risk of operation is great;

these cases should have a transfusion before splenectomy. Transfusions should be done some days previous to splenectomy because there are instances where a combination of both procedures has caused more of a reaction than was to be expected from either alone.

In regard to the time of operation, splenectomy should not be done during a down wave of the disease or in a severe relapse. The operation gives its best results when the course of the disease is stationary or the patient is gradually improving. It is not a procedure of desperation and should never be done as an emergency; it should be reserved for selected cases in good operative condition and in a suitable stage of the disease for operation.

In regard to transfusion following splenectomy, it is believed that splenectomized cases responded better to transfusion than others.

In regard to treatment by the roentgen ray, the experience of the authors is inconclusive; they have seen no benefit which could be directly attributed to the action of the rays.

In their summary of this study of 96 cases of pernicious anemia, the authors believe that there is no known treatment that cures. The diagnosis is not to be made on a blood smear alone and unfortunately it is seldom made early; transfusion and splenectomy offer the best means for inducing remissions, though a remission can occur spontaneously, as marked as those inaugurated by these procedures; no case is too sick for transfusion. Splenectomy is a palliative operation; it is more frequently followed by good remissions than are any other forms of treatment, but should be reserved only for selected cases in certain stages of the disease. It is a serious procedure, never to be urged upon the patient, but may be advised with the clear understanding that its effect is only temporary. Transfusion and splenectomy cause the patients to improve and to live more comfortably, and perhaps in certain instances prolong life. Probably transfusions begun early, so that patients do not remain extremely anæmic for long, will give the best ultimate results.

ELIAS FISCHER.

Robertson, L. B., and Watson, C. G.: Further Observations on the Results of Blood Transfusion in War Surgery. *Brit. M. J.*, 1917, II, 979.

Since a previous paper, blood transfusion has been used in cases of severe primary hemorrhage, accompanied by shock. In four cases of this series the citrate method was used; one case was done with the Unger two-way stopcock, the remainder by the Lindeman syringe cannula method.

The results have shown that certain cases heretofore considered as inoperable and others as exceedingly bad surgical risks may often be revived to a degree which not only permits of radical operative measures, but insures a good prospect of recovery; also that in other cases in which the post-operative condition is one of progressively increasing

shock, due to the initial loss of blood, and to the severity of the operative measures required, blood transfusion is a permanent resuscitative measure of extreme value.

If the bleeding can be controlled, the ideal time is as soon as the patient is seen. If operative interference is necessary before the bleeding can be controlled, blood transfusion may be carried out before the patient leaves the operating table. Clinical observations appear to show that some degenerative changes take place in the organism when the exsanguinated condition persists for more than a few hours. For this reason it is advisable to give the blood as soon as possible after admission, if circumstances permit.

Other great factors in the production of shock are loss of body heat and physical exhaustion, which after transfusion can be controlled with warmth and rest for a few hours before operation. Acidosis incident to the shocked condition may be treated by the administration of sodium bicarbonate.

The benefit of blood transfusions has its limitations, and it should not be used indiscriminately.

The amount of blood transfused has usually been 700 to 1,000 ccm., sometimes less and at times more, but the most immediate and lasting results have been obtained with the large amounts. Cardiac dilatation has not been observed.

A wounded man who has lost much blood and has a blood-pressure below 90 mm. mercury is not a good subject for operation; with a blood-pressure below 70 mm. mercury he is in a precarious condition. In the cases of severe primary hemorrhage accompanied by shock, blood transfusion frequently produces an immediate and almost incredible improvement.

The change from a pallid, sometimes semiconscious patient with a rapid flickering pulse to a comparatively healthy-looking, conscious and comfortable patient with a slower and fuller pulse is dramatic evidence of the value of the transfused blood. In those cases in which readings were taken during the subsequent forty-eight hours it was shown that the rise in blood-pressure was well maintained.

The author reports 26 cases of primary hemorrhage in which transfusion was done. The results are classified as follows: life saving, 22 cases; immediately beneficial, but died from infection or operation, 9 cases; no benefit, 3 cases; death by hæmolytic, 2 cases.

V. C. HUNT.

Kritchevsky, I. L.: Hæmolytins of Vegetable Origin. *J. Exp. Med.*, 1917, xvi, 609.

Kritchevsky has already reported the results of an investigation on the bacterial agglutinins, precipitins, bacterial and albuginous, and hæmagglutinating substances found in the sap of cotyledon *scheideckeri*. This article deals with the hæmolytins which Kritchevsky discovered in the sap of this plant.

His experiments show that hæmolytic is observed

only in sap that contains hæmagglutinins; when the cotyledon sap is deprived of hæmagglutinins it does not possess hæmolytins. Moreover, hæmolytic never appears in cotyledon saps and the hæmolytic power is measured by the intensity of color of the liquid covering the erythrocytes. According to von Liebermann, ricin also never gives complete hæmolytic. The experiment can be performed with ordinary test-tubes, but Kritchevsky used centrifuge tubes as they permitted a more rapid procedure, and he submitted the suspension to centrifuging after half an hour at 37°.

It has been stated that the agglutinated erythrocytes were thoroughly shaken in cotyledon sap; and the agglutinated clot again furnished a homogeneous suspension, at least macroscopically homogeneous. This restoration of the original suspension was necessary in order to obtain hæmolytic, as was shown in one of the experiments.

Two other series of experiments led the author to the conclusion that either a definite quantity of red cells is able to bind only a quantity of hæmolytins which is insufficient for complete hæmolytic, or that the red cells are so modified during the process of binding the hæmolytins by other substances contained in the sap and also by the red cells themselves that they can no longer be completely hæmolyzed.

He proves further that 0.5 ccm. of a 10 per cent suspension of sheep corpuscles is unable to bind the total amount of hæmolytic contained in the sap. Further experiments also confirmed the hypothesis that the same receptor formed the object of binding for the vegetable hæmolytic as well as for the hæmolytic amboceptor, and that in consequence the two hæmolytins could not be bound with the red cells simultaneously, because the hæmolytic possessing a greater avidity left no place for the other one.

From his entire series of experiments Kritchevsky was able to draw the following conclusions:

The sap of cotyledon *scheideckeri* possesses hæmolytins for the red corpuscles of different animals.

The hæmolytins of vegetable sap can be bound by erythrocytes and cannot be separated.

A definite quantity of erythrocytes is able to extract from the sap only a part of the hæmolytins it contains.

The quantity of hæmolytins in the sap of different plants is subjected to the same fluctuations as that of bacterial agglutinins, precipitins, and hæmagglutinins.

As the hæmolytins are bound by erythrocytes, the hæmolytic can take place not only at 37° but also at 15° or 16°.

The thermostability of the hæmolytins varies from one individual plant to another.

In many cases the vegetable sap loses its hæmolytic properties at a certain temperature and recovers them at a higher one.

The vegetable sap is unable to produce complete

hemolysis of erythrocytes, but the sap of many plants acquires the power to dissolve red corpuscles completely after one hour of heating at 134° and 144°.

Erythrocytes modified by cotyledon sap cannot be dissolved completely even by distilled water.

The agglutination of the erythrocytes and their hemolysis are conditioned, probably, by different substances.

The hemolytic amboceptor and the hemolysin of cotyledon *scheideckeri* can be bound with the same receptor of the erythrocytes.

GEORGE E. BEILEY

BLOOD AND LYMPH VESSELS

Jones, E. G., and Walts, C. E.: Treatment of a Double Femoral Aneurism by Proximal Occlusion with an Autoplastic Fascial Flap. *Surg., Gynec. & Obs.*, 1917, xxv, 689.

The authors partially constricted the primitive femoral with an autoplastic flap dissected from Poupart's ligament for the purpose of treating two aneurisms in the thigh. Twenty-six months after operation the patient was well and showed no signs of the aneurisms. Functioning in the leg remained normal, except for some numbness about the calf.

In order to discover if such a band would be dangerous from the standpoint of erosion and hemorrhage, and if, when so applied, there would be material danger of gangrene or loss of function, they treated the primitive femoral twenty-four times in dogs with uniformly satisfactory results.

They also believe that the partial occluding band results in gradual complete occlusion of the vessel. Histologic examinations from twelve to fourteen weeks after operation show the fibrous band grafted about the circumference of the vessel.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Bland-Sutton, J.: Misplaced and Missing Organs. *Brit. M. J.*, 1917, ii, 667.

The author describes an intrathoracic stomach presenting unusual features. A woman, aged 36, complained of gastric disturbance so severe as to justify an examination with X-ray and an opaque meal. Radiographs disclosed the shadow of a body above the diaphragm, displacing the heart to the left.

The patient underwent operation. The parts were exposed by a median supra-umbilical incision, but no stomach was visible. A cleft was found in the diaphragm on the right side of the esophagus from which the small intestine emerged. The stomach was lying in a pouch extending into the thorax. It was withdrawn and was seen to be of normal size, but with very thick walls; on being released, it at once slipped out of sight into the pouch.

Examples of misplaced appendices, undescended cæcum, pelvic kidneys, mastoid teeth and double skulls are given.

EDWARD L. CORWELL.

Brooks, B.: Studies in Bone Regeneration. *Ann. Surg.*, Phila., 1917, lxxv, 625.

Brooks has conducted a series of experiments on the regeneration of bone. These experiments show conclusively that a defect in the shaft of a bone may be quickly and completely regenerated after placing within the defect an autotransplant of living bone with periosteum and endosteum.

The regeneration of bone to repair the defect originates in portions of the normal bone regenerating elements of the graft which remain viable. He questions whether the transplanted bone matrix and bone-cells retain their viability for a short period of time. The identity of the transplanted bone, however, is ultimately lost as a result of absorption and replacement by new bone.

If the periosteum and endosteum together with the adjacent layers of bone are removed from the transplant, it has no osteogenetic properties. If an implant of dry sterile bone is placed in a defect in the shaft of a bone, there is no evidence that such an implant aids in any way the regeneration of the defect. The implanted dead bone neither results in a metaplastic production of bone from the surrounding tissue, nor does it possess any specific property of conducting bone growth across the defect in the bone shaft.

He believes that it is no longer a matter of question that the preservation of the periosteum and endosteum on a free bone transplant is the most important factor in determining the success of the transplant. He offers the following reasons for his belief:

1. The periosteum serves to direct and protect new bone growth.
2. The periosteum aids in securing early nourishment for the transplant.
3. The periosteum is the osteogenetic element of the bone transplant.

He states that there are both external and internal factors which determine the regeneration and growth of bone from a free transplant. The power of a free bone transplant with periosteum and endosteum to regenerate bone is an intrinsic property. The ability of the regenerating bone to continue the production of new bone until a functioning bone is completed is determined by external influences. He applies the term "functional demand" to the combination of the external influences.

He concludes his article by saying that a free bone transplant with the periosteum and endosteum is certainly the only type of implant which may be expected to be the source of new bone formation. An implant of sterile dry bone or a transplant of living bone without periosteum or endosteum may be used as a means of fixation; or in cases of small defects in bone, such an implant may ultimately accomplish the desired result of regeneration of the defect by being absorbed and replaced by new bone originating from bone adjacent to the implant. Such a result may not be accomplished in cases of large defects. The osteogenetic power of a free

bone transplant varies with the age of the individual and general constitutional conditions. Results in children are more likely to be better than in old or poorly nourished individuals.

Two possibilities of devising means for increasing the osteogenetic power of the transplant have been suggested:

1. The use of a transplant from another individual in which there is greater potential power of osteogenesis.

2. The possibility that the osteogenetic power of the graft may be increased by causing artificial injury to the bone from which the graft is to be taken and thus causing new bone formation and subsequently transplanting the growing bone.

Experiments are now in progress to determine the value of these methods. G. W. HOCHREIN.

Nutt, J. J.: Neurotization of Paralyzed Muscle by Muscle Grafting: a Laboratory and Clinical Study. *J. Am. M. Ass.*, 1917, lxi, 2082.

The idea is proposed of effecting partial return of function to muscles paralyzed by poliomyelitis by muscle grafting and consequent extension of the motor nerves from the unaffected muscular tissue.

Former operations for tendon transplantation in local paralyses give evidence that the destruction of the intermuscular septum and sarcolemma allows projection of nerve fibers from sound to paralyzed muscle, and resultant restoration of function.

A laboratory report is given, with illustrative sections, to support this theory. The sections are obtained from cases of experimental paralysis by nerve section, followed by muscle grafting and partial restoration of function, subsequent sectioning showing new nerve fibers from sound to paralyzed muscle, and restoration of normal histological elements of the muscle fibers.

Operative technique is described and 16 cases are cited, in which 7 promise good results. Success of this procedure is more assured by early operation, before all intelligence of the muscle fiber is lost.

V. E. DUDMAN.

ROENTGENOLOGY

Montgomery, D. W., and Culver, G. D.: The Pre-Operative Reduction of Epithelioma by Roentgen Rays or Radium. *J. Cutan. Dis.*, 1917, xxxv, 837.

The authors regard it as an accepted principle to precede operative treatment of cancer in certain locations as, for example, of the uterus, including its cervix, of the vagina, of the rectum, tongue and lips, by a primary radiation with radium. They believe a similar procedure may be made use of in cancer of the skin to reduce the resulting scarring and deformity or to bring an inoperable lesion within the limits of eradication.

In support of this contention a case is cited of large epithelioma of the side of the nose which was inoperable when first seen, but was completely

healed by roentgen radiation followed by curetting and further radiation. They think prolonged moderate irradiation is preferable to short intensive dosage; also that healing induced by treatment with roentgen rays alone is deceptive. Recurrence may take place from cell rests located deeply which had not been reached. An example of such a case is given.

ADOLPH HARTUNG.

Levin, I., and Joseph, B.: Morphologic Appearance of Cancer Clinically Cured by Radium and Roentgen Ray. *J. Am. M. Ass.*, 1917, lxi, 1068.

The authors first discuss the terms "radical cure," "clinical cure," and "improvement." A surgical statement that a cancer case is radically cured implies that the patient is alive and free from the disease from three to five years after the operation. This is a wrong conclusion, however, for according to the figures of Heurtaux a considerable percentage of recurrences take place after the four or five years. More correctly speaking, the cases mentioned above should be put under the head of clinical cures.

A clinical cure of a cancer means a gross destruction or diminution of the size of the primary tumor, with disappearance of the symptoms and a state of well-being continued for a sufficiently long time to preclude the possibility of a spontaneous remission of the disease.

An improvement or palliation involves the alleviation of symptoms without any inhibition of the development of the growth of the malignant tumor.

It has been definitely demonstrated that the action of radium and roentgen ray therapy is to effect a palliative or a clinical cure, if not a radical cure, and the fact that a radical cure is not obtained does not detract anything from the value of the method.

As to how the radiation produces its effect, the general statement is made that tissues consisting of less differentiated, younger cells, cells in a state of active proliferation, are most deeply influenced by the rays, and that consequently there is a selective action of the rays on the actively proliferating tumor cells, as compared with the normal organ cells. First, there are morphologic changes noted in carcinomatous or sarcomatous tissue under radiation which are noted in the tumor cells themselves, these being manifested by the vacuolation of the protoplasm, pyknosis of nuclei, karyolysis and ultimately complete necrosis of the cell. These cellular changes are accompanied by a round cell infiltration which replaced the destroyed cancer cells. Subsequently this round cell infiltration is changed into dense sclerotic connective tissue poor in blood-vessels. This connective tissue formation becomes extensive, surrounds islands of cancer cells, and assists in the destruction of the latter. Some observers maintain that the action of the rays has been confined to the production of connective tissue, and that the cancer cells are affected only secondarily, the result of disturbed blood supply following the sclerosis of the new connective tissue.

The authors obtained pathologic sections from a

case of carcinoma of the sigmoid, with metastatic dissemination in the peritoneum, a case of carcinoma of the breast with axillary involvement, an inoperable case, a melanotic cancer involving the skin in the right supraclavicular region, and an adenocarcinoma of the ascending colon.

In the case of carcinoma of the sigmoid, the patient died from acute intestinal obstruction, previous to which massive doses of roentgen rays had been given. At autopsy, the peritoneum was studied with numerous white plaques. Microscopic study of a section taken through two loops of small intestine that were firmly bound together by adhesions showed that the latter consisted of a thick layer of connective tissue containing occasional groups of tumor cells. During six months, it was demonstrated that not a single one of the minute nodules found at the operation developed into a discrete secondary tumor, and the primary sigmoid tumor did not increase in size during that time.

In the case of the breast carcinoma, seventeen months following the beginning of the treatment with radium and the roentgen rays the patient died and a necropsy was performed. A minute search was made for possible metastases, but none were found. Microscopic examination of the tumor of the breast showed a scirrhous carcinoma and the lymphatic glands of the axilla were filled with solid carcinoma. While morphologically the tumor presented no change, still after a year and a half there was no evidence of dissemination or metastasis, and the authors concluded from this that there was a distinct inhibition of the growth as the result of the roentgen exposures; that is, the carcinoma was transformed into a biologically and clinically benign type of tumor, although the morphological appearance was not changed.

In the case of melanotic carcinoma, after two years and a half the patient was clinically well, and no metastatic tumors had developed. The ulcer had healed, and the growth, although diminished in size at first, finally remained stationary. The authors consider this another case where radiotherapy inhibited the proliferating power of the cancer cells and arrested the growth of the tumor, without producing any apparent morphologic change.

A clinical inhibition was also obtained in the case of adenocarcinoma of the ascending colon. In this case, the morphologic appearance was changed from an adenocarcinoma to a benign adenoma.

The conclusions are then that both clinical investigations and experimental studies bear out the view that the action of radiation of radium and roentgen rays is to impair the proliferating power and consequently the malignancy of cancer cells, without producing change in the morphologic appearance of the tumor. That is, the first action of the rays is to effect a sterilization, as it were, of the cancer cells. The sclerosis which follows is explained both by the direct action of the rays and the natural history of the cancer cell. It is imperative, therefore,

that every malignant tumor should be subjected to radiation, both before the performance of a partial or radical operation, and also following the operation.

W. A. EVANS

Hubeny, M. J.: The Roentgen Ray in the Diagnosis of Gastro-Intestinal Disease. *Intern. M. J.*, 1917, xxiv, 916.

The clinical value of the roentgen ray in the diagnosis of gastro-intestinal disease has now become widely recognized. Twenty years ago Cannon of Boston first used bismuth subnitrate in food to study the living stomach of a cat, and soon after the human stomach was examined in the same manner. The plate method together with fluoroscopic examination gives the best results. Without the plate method useful evidence may escape in fluoroscopic examination alone.

Holzknicht with his assistants Jonas and Handek compiled a system or series of symptom complexes based on their large experience, as follows:

1. Normal stomach.
 - a. Stomach empty after six hours. Head of bismuth column in ascending colon.
 - b. Stomach shadow normal.
 - c. No increased peristalsis. No antiperistalsis.
 - d. No sensitive pressure point.
 - e. Hydrochloric acid normal.
2. Simple gastric ulcer.
 - a. Small residue after six hours.
 - b. Sensitive pressure point over the stomach.
 - c. Normal stomach shadow.

Other confirmatory symptoms are: antiperistalsis displacement of the pylorus upward and to the left, snail form of the lesser curvature, stable transverse contraction, changing transverse contraction.

3. Old contracting ulcer on the lesser curvature of the pars pylorica.
 - a. Small bismuth residue after six hours.
 - b. Pressure point.
 - c. Displacement upward and to the left.
 - d. Snail form of the stomach.
4. Callous ulcer of the pars media.
 - a. Small bismuth residue after six hours.
 - b. Pressure point and resistance in the pars media.
 - c. Transverse contraction of the pars media.
 - d. Diverticulum without air bubble in the smaller curvature, immovable.
5. Old stenosis of the pylorus, due to ulcer.
 - a. Large sickle-shaped bismuth residue after six hours.
 - b. Dilatation.
 - c. Loss of tone.
6. Ulcer of the duodenum.
 - a. Stomach empty in six hours. Head of bismuth column in the ascending colon.
 - b. Stomach shadow normal.
 - c. Pressure point moving with the duodenum.

Handek's niche, if present, is conclusive evidence of a gastric ulcer. In this, there is an accumula-

tion of the opaque material which has emerged through the penetrating ulcer and shows on the posterior wall or lesser curvature of the stomach in the form of a pouch. With the patient upright, the opaque material has above it a gas bubble.

The hour-glass deformity due to cicatricial contraction of an old ulcer must be differentiated from spasmodic hour-glass and deep peristaltic contraction. Painful pressure points associated with abnormal contours are highly suggestive. The spasm due to gastric ulcer, duodenal ulcer, pancreatic involvement, cholecystitis, and appendicitis must be differentiated.

Duodenal ulcer should be examined by the serial plate method. This is considered by the author to be the best method of examination for this condition. The deformities of the cap as observed roentgenologically exceed the pathological surgical findings, and the supposition is that intrinsic spasms of the caput occur similar to gastric spasm associated

with gastric ulcer. The usual types of deformity show:

1. Niche-like cavities.
2. A small compact shadow with no regularity of contour. If due to obstructing ulcer, there may be hyperperistalsis, antral dilatation and six-hour residue.
3. The presence of incisura.
4. General distortions with sharp finger-like projections and incisura-like indentations.

In addition to the above direct, the following indirect findings are corroborative: (a) gastric hypertonus, hyperperistalsis and hypermotility; (b) six-hour gastric residue; (c) dilatation of antrum pylori; (d) gastro-spasm; (e) duodenal diverticulum.

The essential clinical data should be correlated with the direct or inferential signs, as no one method should be neglected in ascertaining a correct diagnosis.

C. B. HOLMES.

MILITARY SURGERY

NOTE—Readers are referred to the Table of Contents for other articles dealing with military surgery which appear under the various headings according to our anatomical arrangement.

McKenzie, R. T.: The Treatment of Nerve, Muscle, and Joint Injuries In Soldiers by Physical Means. *Canad. M. Ass. J.*, 1917, vii, 1057.

The conditions to which physical therapy applies are as follows:

1. Injury to peripheral nerves all the way from the bruising of a nerve-trunk to its destruction and restoration by surgical means. There is weakness or paralysis, muscular wasting and contracture. The treatment is met by the application of support to prevent overstretching of weak muscles and to prevent contracture of those that are unimpaired, massage, electricity, passive and active motion, and later gymnastic and vocational training.

2. Scar tissue may contract in such a manner as to impede the circulation and by pressure on nerves may produce severe pain in addition to the cold, clammy and cyanotic extremity. The whirlpool bath for twenty minutes changes the cold purple of a hand or leg into a warm crimson and the masseur is able to massage and manipulate that which before the bath was impossible.

3. Old septic wounds are frequently persistently painful long after they have healed. Massage very frequently discovers and brings to the surface the infection, in the form of a sequestrum or other foreign body.

4. In all postoperative conditions the cure must be applied by physical means. It is not enough to break down an adhesion or to restore a joint to potential usefulness. Its function must be improved and the patient must be taught to use it.

5. Functional neuroses such as paralysis, contractures, loss of sight, speech or hearing, areas of

anesthesia or hyperæsthesia, show many remarkable cures by systematic massage, exercise and electricity in connection with suggestion and encouragement.

6. Treatment of shell shock consists of rest and sedative treatment by the continuous bath at skin temperature and the substitution of gentle massage and electricity for active movements at first, with a gradual increase of exercise.

7. "Soldiers' heart" is a symptom of overstrain. The pulse is rapid, there is dyspnoea, and the thyroid gland is enlarged. The frequency current, the sedative bath, electric massage and rest rapidly produce improvement.

8. The after-treatment of sprains, fractures, rheumatism and gout consists of massage, electricity and hydrotherapy. For painful conditions such as neuritis, neuralgia, or for any condition requiring active hyperæmia, electricity is of value. The high frequency current used in diathermy causes a sensation of warmth and has great power of deep penetration. Radiant heat is supplied by means of electric lamps in an electric light bath in a cabinet. Heat thus produced is alternative and assists elimination. The whirlpool baths are very valuable. The arm or leg is plunged into a vessel containing water at about 105 degrees which is circulated by a propeller. Air is also introduced so that the limb is surrounded by a swirling, bubbling current, the temperature of which is raised to 120 degrees. These baths are especially effective for painful stumps, painful scars, and for conditions which lower the circulation and nutrition of the member, and when followed by active motion together with

massage judiciously applied, are of great value. Various parts of the body are exercised by various forms of apparatus. Gymnastics in the form of games or sports, together with occasional therapy or functional training must be judiciously applied.

J. J. KURLANDER.

Uffoltz: Abortive Treatment of Infected Wounds
(Le traitement abortif de l'infection des plaies).
Arch. de méd. et pharm. mil., Par., 1916, lxx, 1.

The author reports 130 non-selected cases of infected wounds treated by the Carrel method. There were 78 recoveries. These include 52 without fracture with an average treatment lasting 24 days and giving preservation of functional integrity in 47 cases. Nineteen were fracture wounds with an average of 57.5 days of treatment and preservation of functional integrity in 11 cases. Seven articular lesions had 44.5 days of treatment with functional preservation in 3 cases.

Forty-nine cases are still in course of treatment or were evacuated to other hospitals. There were 3 deaths.

Short histories of the 130 cases are given with temperature curves in the case of the more important lesions. The cases comprise all types of wounds.

W. A. BRENNAN.

Shirey, G. O.: Present Methods in Military Surgery.
J. Arkansas M. Soc., 1917, xiv, 140.

Shirey reports a lecture delivered by Bernard of the French army.

Due to changes in the methods of warfare, the treatment of wounds is radically different than heretofore. In the Russo-Japanese War and the Balkan Wars the wounds were caused by smooth bullets, and no operative interference was attempted; the wounds were simply dressed and the patients sent to base hospitals. With the advent of the widely used shells, projectiles and grenades, the wounds are ragged and there is much destruction of tissues. Early in the war when these cases were left alone, a large majority of them came to the base hospitals with gas gangrene.

The present practice is to do a "debridement." This consists in opening the wound and removing all dead and badly mangled tissues. If the shell is easily found, it is removed at once; otherwise no search is made.

It has been found that gas gangrene is most dangerous when the wound is in the calf of the leg. Next in order come the thigh, forearm, arm, and buttock.

To better understand how the French handle their wounded, a case is followed from the field. At the first aid station the injured part is washed with pure alcohol, painted with tincture of iodine and dusted with Vincent's powder, i.e., hyperchlorite of lime 10 parts and loric acid 90 parts. If indicated, a tourniquet is applied next to the skin and a tag attached to the patient stating "emergency tourniquet applied."

The case is then sent to the surgical advance station which is equipped with operating rooms and wards. Here if necessary a "debridement" is done and the patient is sent by motor to the evacuation group located about twenty kilometers behind the front lines. From here the patient goes direct to the base hospital.

The treatment then is as follows: Nearly all wounds come from the battle front septic and here either normal saline or Carrel's solution is used. Bernard reports rather favorable results from the use of Carrel's solution.

In short operations ethyl chloride as a general anæsthetic is used, while in prolonged operations ether is chosen. General anæsthesia is used almost entirely.

In preparation for the operation, the area is not scrubbed, but is cleaned with ether, then washed with Dakin's solution and painted with tincture of iodine.

Early in the war operation was not done on abdominal cases, following the favorable reports of expectant treatment from the Boer War, the Russo-Japanese and the Balkan Wars. Later the Murphy operation was done, i.e., an opening was made in the hypogastric region and a drain inserted. This proved unsuccessful if there was a perforation or hemorrhage.

Now operation is performed if possible. In thoracic abdominal wounds a general anæsthetic is dangerous and no attempt should be made to operate after the first thirty-six hours. For general thoracic cases medical treatment holds out the best chances for recovery, namely, compressive bandages, salines, gelatinous serum, morphine and absolute rest.

In cranial cases transportation is dangerous. Here foci of infection are removed if present. In fracture of the skull, any decompressed bone is removed by making five holes in polygon shape and sawing between with a gigli saw. The dura is not opened if no signs of injury exist. No antiseptics are used on the brain as they are irritating. Frequent lumbar puncture is employed to prevent hernia cerebri.

In cases of shock, heat, saline and adrenalin, camphor in oil and strychnine are used. Morphine also is used if required.

In cases of gas gangrene, treatment includes "debridement" and continuous irrigation with Carrel's solution. Serum treatment in this condition has not proven satisfactory.

I. E. BISHKOW.

Mott, F. W.: The Microscopic Examination of the Brains of Two Men Dead of Commotio Cerebri Without Visible External Injury. *Br. M. J.*, 1917, ii, 612.

The examination of the brains of two cases of death from shell shock without visible injury and without punctate hemorrhages indicative of gas poisoning is of interest for several reasons. This is the first description that has been given which serves

to explain (1) sudden death in shell shock, and (2) the clinical symptoms which persist for some time after the commotion of the brain in non-fatal cases.

A man developed a degree of nervousness on the Somme which he never lost, but was able to control for six months. Later he was in an area which was subjected to an intense bombardment, during which, as far as can be ascertained, no gas shells were used. This lasted about four hours. Although he remarked to another man that he "could not stand it much longer," he did not give way until the following day, twelve hours later, when perhaps six shells came over.

He was not buried nor "gassed." One shell burst just behind his dugout, ten feet away, in the morning, but many must have been as near the previous day. Early symptoms were tremors and general depression. The later symptoms were coarse tremors of the limbs, crying, inability to walk or to do anything. He would not answer questions, very like the hysterical manifestations of melancholia. The pupils were dilated. The man was admitted to the field ambulance in the evening in a state of acute mania, shouting, "Keep them back, keep them back." He was quite uncontrollable and impossible to examine. He was quieted with morphine and chloroform and slept well at night. The next morning he woke up apparently well, and suddenly died.

The summary of the histologic changes is as follows: There was a generalized early chromatolytic change in the cells of the central nervous system.

This change varied in intensity. The cells most affected were the small cells in which the basophile substance had partly or nearly disappeared. In the larger cells the Nissl granules were smaller and not packed so closely together as normally. The small cells of the medulla and pons were slightly swollen and the nucleus large and clear. This change was present in some of the large cells, but less evident. This change indicated a relative degree of exhaustion of the kinetoplasm, assuming that the amount of the basophile substance is an index of biochemical neuropotential. The Nissl granules are not present in the neurone during life, but they disappear altogether in a cell that, prior to death of the whole body, has been so injured as to decay and die. Granted this premise, then, it may be assumed that the cells in this case were in a state of commencing nervous exhaustion; some nuclei of cells showed the changes more markedly than others, for example, the cells of the vago-accessorius nucleus.

The vessels of the pia arachnoid membranes of the brain were congested and there were scattered subpial hæmorrhages of microscopic size almost everywhere.

In the white matter of the corpus callosum, the internal capsule, the pons and medulla, there were seen congested veins and hæmorrhage into the sheaths of these vessels, with occasionally extravasation of blood corpuscles into the adjacent tissues.

EDWARD L. CORNELL.

GYNECOLOGY

UTERUS

Risley, E. H., and Leland, G. A., Jr.: A Report of the Treatment of Carcinoma of the Cervix at the Huntington Hospital for a Period of Four Years. *Boston M. & S. J.*, 1917, LXXVII, 591.

Risley reports a series of 113 cases of carcinoma of the uterus treated with radium at the Huntington Hospital from January, 1912, to June, 1916.

The cases are classified in five groups:

Group 1. Cases of border-line operability in which pre-operative radium treatment aims at a reduction in the size and fixation of the mass, rendering the chance of total extirpation more promising. Five such cases were made operable by radium applications, making the mass more movable. Three patients are alive at present, one 18 months after operation and without recurrence; one 12 months after operation without recurrence; one 20 months after operation but with local recurrence. Two are dead; one died 3 weeks after operation from a cause not stated, and one was free from disease for 2 years after operation, then recurrence and death took place after 4 months of radium treatment.

Group 2. Cases accepted for prophylactic radiation following radical hysterectomy. Only five such cases are recorded; three are alive without recurrence 15 months after operation; one had recurrence 12 months afterward; one was free from disease 8 months, after which time the case could not be traced for observation; one case died of recurrence 14 months following the operation.

Group 3. Postoperative or recurrent cases: 37 recurrent after hysterectomy. Three have not been traced; 8 are alive and free from disease; 2 are in questionable condition; 5 have had definite recurrence; 20 are dead. The average duration of life after operation and the beginning of radium treatment was 8 months.

Group 4. Those cases of recurrence or continuation following curettage or cauterization. In almost every case there has been steady progress of the disease since the palliative operation. Of the 22 cases, two were not traced; one is alive and without recurrence 19 months after beginning radium treatment; three were lost sight of; four are alive after an average of 10 months since the institution of the radiotherapy; fifteen are dead. The best results are obtained in cases thoroughly cauterized, with all the carcinomatous area removed and a real crater of the cervix formed into which the radium can be introduced immediately.

Group 5. Inoperable cases where radium can only be used as a palliative measure. Of the 22

cases, one has not been traced; three are alive 22 months after starting radiotherapy; there is an apparent retardation of the growth and general improvement in their condition; 18 are dead, showing an average duration of life of 9½ months. In these cases three things can be accomplished with radium: a checking of the hemorrhage, control of the foul discharge, and often relief of pain.

The author advises prophylactic radiation following hysterectomy. The treatment of early recurrence offers a fair prognosis. Late treatment offers only alleviation of symptoms. Inoperable cases are made more comfortable with probable prolongation of life. Radium should be given earlier and for a more extended period in these cases. All operated cases should report for observation once a month for the first year, once in three months for the second year, and at frequent intervals during the succeeding years, so that early radiotherapy can be administered in cases of recurrence.

L. R. GOLDSMITH.

MacFarlane, W. D.: Uterine Fibroids; Notes on Their Diagnosis, Complications, and Treatment Based on the Observation of 150 Cases. *Glasgow M. J.*, 1917, vi, 257.

In the author's series of cases, 110 supravaginal amputations of the uterus were performed with excellent results. The mortality was 3 per cent. In uncomplicated fibroids the mortality should be nil; it, however, varies from 1 to 2 per cent. When there is any suppurative or degenerative change the mortality increases. All the deaths in this series occurred in fibroids with pyosalpinx or some form of infection. Panhysterectomy was performed in five cases on account of malignant new-growth invading the tumor; all the cases made a good recovery. Myomectomy or enucleation was undertaken in fifteen cases with good results, pregnancy following at various periods in several and no difficulty being met with during labor. It is a general rule not to perform enucleation on tumors which markedly involve the endometrium.

The following principles should be followed in deciding between myomectomy and supravaginal amputation or total hysterectomy:

1. Where there is malignant new-growth a panhysterectomy according to the radical method should be performed.

2. Multiple fibroids are, as a rule, most effectively dealt with by supravaginal amputation of the uterus.

3. Pedunculated tumors should be treated by myomectomy.

4. Infected submucous fibroids are most safely removed by vaginal myomectomy.

It may be stated, as a result of surveying these 150 cases with care, that:

1. Fibroid tumors of the uterus are rare under thirty years of age and frequent over that age. The earliest recorded case is that of a girl thirteen years of age, reported by Cavaillon.

2. All fibroid tumors need to be carefully watched, as they may become a source of danger to the patient.

3. The menopause does not necessarily bring about a cure; as the patient grows older, these growths constitute an increasing danger.

4. The risk of malignant new-growth arising in a fibroid before forty years of age is not great; after that time the danger increases with each year.

5. When these tumors produce symptoms sufficient to cause the patient to consult her medical attendant, surgical treatment is indicated, or deep-seated therapy by X-rays. Palliative treatment has a distinct place, but is very generally unsatisfactory. Many of the cases operated upon had previously been subjected to long periods of medical treatment and invalidism, and were finally forced to have relief by surgical procedure.

6. In properly selected cases treatment by X-rays gives good results.

7. Cases of small uncomplicated fibroids do not require treatment, but should be medically supervised regularly.

8. Uterine fibroids predispose to sterility, but do not prevent conception. If a patient is known to have had uterine fibroids prior to her pregnancy, careful examination of the pelvis should be made at least one month before labor is expected; after delivery the third stage of labor must be carefully watched for a severe postpartum hemorrhage; the puerperium must be supervised with care, as possible infection or degeneration of the tumor may occur. Many pregnant women with uterine fibroids have a perfectly normal labor.

9. Atrophy of the fibroid occasionally occurs after the pregnancy and puerperium are completed; it is, however, of rare occurrence.

EDWARD L. CORNELL.

Chome, E.: A Case of Pyometra (Sur un cas de pyométrie). *Arch. mens. d'obst. et de gynéc.*, Par., 1917, v, 285.

Chome gives the clinical history of a case of pyometra observed in a woman of 57 years. The case from the symptoms was believed to be a degenerating fibroma, and a subtotal hysterectomy was done. On making the section, a large quantity of pus, which had filled the uterine cavity, escaped into the peritoneum. The woman recovered. The uterus showed three kinds of distinct neoformations: a first clearly cancerous; a second due to proliferation of the glandular system; the third formed of clear cells superficially developed.

The case agreed with the classical picture of pyometra. This lesion is habitually a complication of cervical cancer. In 50 cases which the author found reported, there were 39 cervical cancers, 4 corpus and 2 isthmic cancers. In 273 cervical cancers collected by Buerkle there were 17 cases of pyometra. The cancer is usually scirrhus, producing a stenosis which prevents the free flow of fluids, and these consequently accumulate in the uterine cavity. The distention is facilitated owing to the fact that the uterine muscle has lost in contractility either on account of senile sclerosis or fibromatosis.

Pyometra is almost exclusively observed in the cancers of elderly women from 55 to 70 years old. Except in cancer cases, pyometra is very exceptional. In young women it is occasionally found where there is a congenital malformation of the genital organs.

The presence of an obstacle at the uterine neck is not sufficient in itself to create a pyometra. Normally the secretion of the uterine mucosa is insignificant and some lesion of the mucosa must be present which causes abnormal secretion. In cases of cervical cancer, infection of the uterine cavity is easily understood.

In the reported cases of pyometra, the mucosa was only rarely examined. The lesions found were those of endometritis, especially of the type called senile. These lesions are either glandular, interstitial or of a mixed type, all being different stages of an infective process. In the author's case the histologic tissues showed hyperplastic endometritis and interstitial endometritis with atrophy and epithelial destruction.

The author thinks that pyometra is only a particular form of senile endometritis; but in young women with malformation it results from suppurative hæmatometra.

The bacteriology of the condition has been insufficiently investigated. Streptococci, staphylococci and the colon bacillus have been found.

Diagnosis is rarely made, but should be considered in cases of cancer with senile atresia of the cervix and distended uterus.

W. A. BRENNAN.

Stone, I. S.: Development and Perfection of the Interposition Operation for Prolapse of the Uterus and Bladder. *Tr. South Surg. Ass.*, St. Augustine, 1917, Dec.

The author states that the operation is a result of the split-flap method of Arx and Sanger, who made a longitudinal incision through the anterior vaginal wall and separated the bladder from it and the anterior wall of the uterus in the treatment of cystocele. Then came the various methods of Freund, Wertheim and Mackenrodt; the latter called his method vaginofixation, which was successfully used to overcome retroversion of the uterus.

The methods of Freund and Wertheim involved turning the uterus out into the vagina and fixing

the organ permanently in that position. This objectionable procedure was promptly followed by the method of bladder elevation upon the uterus and fixation of the uterus to the entire length of the upper and outer surface of the anterior vaginal wall, immediately upon the former site of the bladder. This operation was exploited by several continental surgeons, each of whom claimed priority; but it is absolutely certain that Dührssen and Schauta in Germany and Austria respectively, and Watkins in America were influenced by those operators who introduced vaginal fixation of the uterus, although they have or should have the credit of developing, perfecting, and firmly establishing an operation which has proved the most reliable of all vaginal methods of treating prolapse of the uterus and bladder.

EXTERNAL GENITALIA

Bertino, A.: Obstetrical Vesicovaginal Fistula and Uterovaginal Fistula: Radical Treatment by Uterocystostomy (*Fistola vesico-vaginale e fistola utero-vaginale ostetriche-cura radicale; uterocistostomia*). *Ann. di ostet. e ginec.*, Milano, 1917, xli, 41.

The patient in Bertino's case was a primipara twenty-two years of age. The fistulae were due to forceps manipulations, the patient having a contracted pelvis. The co-existence of two fistulae of this kind is rare and not usually recognized; the vesicovaginal fistula being more easily accessible, the second fistula is not observed and is only found when later trouble arises. In this case the diagnosis of the double fistula was not made, and as the fistulous flow of urine continued after treatment of the vesicovaginal fistula, the author was obliged to proceed to a second intervention.

Of the various operative measures for the treatment of uterovaginal fistula, the author decided on a mixed route of approach, namely, intra-extraperitoneal, hoping to be able to avoid the danger of polluting the peritoneum by terminating the operation extraperitoneally. This happened. The technique was very similar to that of Stoeckel, differing only in the fact that in the case reported by the author the ureter was found quite extraperitoneally.

The method was also somewhat similar to that of Legueu who followed the course of the ureter through the peritoneum, closed the peritoneal cavity and looked for its termination subperitoneally, proceeding from above downward, rather than from below upward, as in the author's case. Anastomosis of the ureter to the bladder in this case was by direct suture.

There was some trouble due to suppuration in the post-operative period. The patient, however, recovered and the final result was satisfactory as regards the functioning of the anastomosed ureter and the urinary capacity of the patient.

W. A. BRENNAN.

Leonard, V. N.: Fibroid Tumors of the Vulva. *Bull. Johns Hopkins Hosp.*, 1917, xxviii, 373.

Fibroid tumors of the vulva, although rather uncommon, are by far the most frequent of the benign solid neoplasms found in this region, and an idea of their frequency may be gathered from the fact that but 6 cases appeared among 21,000 gynecological admissions to the Johns Hopkins Hospital.

The tumor usually appeared first as a small, firm, painless nodule immediately beneath the skin of the labium majus. Its growth in some cases was extraordinarily rapid, and the tumor usually soon became pedunculated. Growth continued and actual interference with locomotion was likely to be the first inconvenience experienced by the patient.

When seen by the surgeon, these tumors have in most cases developed a well-marked pedicle, and, hanging between the thighs, present a remarkable picture. The upper surface of the tumor and the skin of the pedicle may be covered by hair. The skin covering the tumor is generally thick and thrown into numerous shallow folds and wrinkles, at once suggesting the skin of the scrotum. The skin is freely movable over the tumor and its surface is usually quite unbroken. On palpation a firm, smooth or slightly lobulated mass is made out which is quite insensitive to moderate pressure. One or more pulsating vessels may be felt in the pedicle. On pulling the tumor and thereby making tension on the pedicle, a tough fibrous cord may sometimes be made out traversing the pedicle and entering the inguinal canal.

As the tumor grows, the circulation may be impaired and the growth become edematous and semifluctuant to palpation. The wrinkles and folds in the skin then disappear, the surface of the tumor becomes smooth and shiny, and ulcerations commonly appear at the most dependent portion. In many cases the tumor undergoes just these changes during menstruation. The tumor may swell to twice its size during the menstrual period, become soft and quite sensitive, and rapidly assume its former size, firm consistency, and relative insensitiveness soon after the cessation of menstruation. Should pregnancy occur, the tumor usually shows the same changes, but in addition may take on a very rapid growth.

The author gives a brief clinical history of each of the cases, describes the operation which was performed and gives a summary of the gross and microscopic examination of the specimens removed. From a study of these cases and a review of the literature he makes the following summary:

Fibroid tumors of the vulva are the commonest of the benign solid tumors of this region and grow to larger size than superficial fibroid tumors in any other part of the body. As a rule, they grow rapidly and soon become pedunculated, and most of them show some form of degenerative change.

The subperitoneal fibromata, which take origin in the pelvic connective tissue and, growing along lines of least resistance, first appear at the vulva,

are the largest tumors on record. The largest tumor ever described was one of this type which weighed 268 pounds.

Excluding the subperitoneal group, the author believes it may be said roughly that two-thirds of the fibroids of the vulva originate in the subcutaneous connective tissue and one-third in the extraperitoneal portion of the round ligament, while nearly one-fifth of them become sarcomatous.

The vascular changes accompanying menstruation and pregnancy are shared by these tumors and exert a marked influence upon them, as is clearly shown by their swelling and sensitiveness under these circumstances. Herein, he believes, lies the explanation of the fact that, almost without exception, they occur in the child-bearing period, that they grow rapidly, that they usually show degenerative changes, and, finally, that a remarkably large percentage of them become sarcomatous.

GEORGE E. BEILBY.

Mauclair: Intense Vulvovaginal Pruritis Treated by Resection of the Perineal Nerves (Prurit vulvo-vaginal intensif traité par la résection des nerfs périméaux). *Ann. de gynec. et d'obst.*, Par., 1917, lxxii, 655.

Mauclair says that when medical treatment fails and pruritis continues to be intense, nerve resection gives good results. He reports a case in a woman of thirty-four years. On the right he exposed the internal pudic nerve at its emergence from the pelvis. A second incision along the ascending branch of the ischium exposed the superior perineal or clitoridean branch nerve. This he resected for about 3 cm. from its origin behind the transverse perineal muscle. Similarly on the left side he exposed and resected about 3 cm. of the inferior perineal branch nerve. Recovery of the patient was normal. The intense pruritis has disappeared but there is still some hyperæsthesia, which the author considers due to the fact that all the sensory vulvar nerves have not been sectioned.

The author reviews the various methods of treating pruritis, and gives an anatomical description of the various nerves supplying the region. Of all treatments for intense pruritis he thinks that resection of the superficial perineal nerves and the genital branches of the abdominogenital branch nerves the best; or at least the first step in surgical treatment. In his own case he resected only the genital nerve branches, deeply on one side and superficially on the other; this resulted in recovery. He did not wish to completely anesthetize the vulva

by sectioning the abdominogenital branches through fear of occasioning cutaneous trophic disturbance.

W. A. BEENMAN.

MISCELLANEOUS

Watkins, T. J.: Cystocele, Uterine Prolapse, Retroflexion and Rectocele Repaired by Plastic Operation upon the Broad Ligaments and Vagina; Fixation of the Round Ligaments and Advancement of the Anterior Vaginal Wall; Perineorrhaphy. *Surg. Clin. Chicago*, 1917, 1, 1021.

The condition is typical as a result of injury at labor especially in the case of instrumental delivery. An inverted T-shaped incision is made, the vagina is separated from the bladder by blunt dissection with the Mayo scissors, and the dissection is carried on to the base of the urethra. The vaginal flap is incised in the median line to the urethra and the hypertrophied mucosa over the body of the urethra is excised.

The bladder is then separated from the cervix and uterus by blunt dissection with the Mayo scissors up to the vesico-uterine fold of peritoneum. The base of the broad ligament is clamped on either side with long forceps and the portion of the broad ligament between the forceps and the cervix is incised. These ends are later to be sewn in front of the cervix. The peritoneum is incised and the uterus is delivered by successively applied forceps. The round ligament on either side is grasped about one and a half inches from its attachment to the uterus and is held with Allis' forceps.

The body of the uterus is next replaced in the abdominal cavity, and at a certain distance from the uterus each round ligament is fixed to the submucous connective tissue as low down in the vaginal incision as possible, so that when the sutures are tied the urethra will be drawn upward in relative fixation.

After the redundant areas of the vaginal flaps are cut away, sutures are passed through the margin of the flap near the base of the urethra, through the body of the uterus above the vesico-uterine peritoneal area and then through the corresponding edge of the vaginal flap on the other side. The second suture is passed parallel to this and about one-fourth of an inch distant.

The rest of the vaginal wound is closed with several No. 1 catgut sutures which are also passed through the anterior wall of the cervix. The anterior lip of the cervix is excised by a V-shaped incision. The cut ends of the broad ligaments are united in front of the cervix. The operation is completed by a perineorrhaphy.

S. W. BANDLER.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Hess, J. H.: The Diagnosis of the Age of the Fetus by the Use of Roentgenograms. *Am. J. Dis. Child.*, 1917, xiv, 307.

A commendable, painstaking study of a subject is given which is often of practical importance in prognosis as to the possibility of saving the life of the prematurely born infant; as to questions of treatment and feeding; in medicolegal questions; and of paramount importance when only parts of the fetus are available. A review is given of the literature as to the time of conception, and as to length, other measurements and weight, as related to the age of the fetus.

This study is based upon the roentgenographic study of 55 normal cases, with ages determined from the history of menstruation and pregnancy and from measurements.

By roentgenogram the first centers are visible in the clavicles and mandible in the seventh week, and from that time the appearance of new centers is rapid. Four tables are given showing in detail the appearance of the centers.

Hess has compared the process of ossification, as observed in the roentgenograms of the fetuses studied, with the roentgenographic studies of Alexander, Bade, Hasselwander and Lambertz, and found that the time of appearance of the centers of ossification agrees in general, there being minor differences only.

Mall, who used transparent specimens of embryos and fetuses, was able to demonstrate the minute centers of ossification generally about one week earlier than they are demonstrable by roentgenograms. This observation also agrees with textbooks of anatomy, which place the time of appearance of various centers about one week ahead of the time at which the centers cast shadows in roentgenograms large enough to be visible.

There are some variations in the normal process of ossification, and it is also influenced by pathologic conditions of the mother and of the fetus; for example, syphilis, rickets, osteogenesis imperfecta, etc. In general, these pathologic processes may be diagnosed in the roentgenograms.

In spite of variations, the process of ossification seems to be more constant for a particular age than the length of the fetus. Mall, in his article on ossification in embryos up to one hundred days old, concludes that "the remarkable regularity of the appearance of the bones makes of them the best index of the size and of the age of the embryo which we now possess."

In the first half of pregnancy the estimation of the

age of the fetus may be made with greater accuracy because many more new centers appear in the first month, and also because the time of appearance of the earlier centers is more constant. In later months centers of the lower part of the skeleton mostly are available for study, and these are less constant in the time of their appearance.

In studying the roentgenograms it is well to use a reading glass of about four inches in diameter, since some centers of ossification may be so small as to be very easily overlooked when sought for with the naked eye.

If only one exposure of the fetus is made, then the best position to show as many ossification centers as possible is as follows: The back lying flat on the plate, the head turned completely to one side so that the side of the head lies on the plate and lateral exposure is obtained. It should be remembered in the study of the skull that both halves of the skull are usually visible. Arms and fingers should be extended and the fingers spread as far as possible from one another. One hand should be pronated and the other supinated. The legs should also be extended and the feet put into such a position that all metatarsals and phalanges are shown.

DAVID R. BOWEN.

Jung, F.: The Treatment of Eclampsia. *Deutsche med. Wchnschr.*, 1917, xliii, No. 8.

Jung thinks that the majority of cases of eclampsia call for hospital rather than for home treatment. The transportation of such patients calls for special precautions. In order to reduce the irritability of the central nervous system, an injection of a centigrams of morphine should be made before removal. Precautions to protect the patient from injury in the event of a possible convulsive attack must be observed; a large piece of rubber should be placed between the teeth and the patient during transportation should be in charge of a competent nurse.

The procedure followed in the author's clinic in Göttingen in the case of eclamptic patients is described.

If the patient is at term and the labor so far advanced that no major intervention is necessary, it is terminated by the forceps, or by version, under ether narcosis. If the labor is not sufficiently advanced a conservative attitude is adopted.

If more than two hours have elapsed since the first morphine injection, another injection of 1 cg. of morphine is given and 2 hours later 2 grams of chloral hydrate are administered as an enema. If no previous narcotic has been administered, Stroganoff's prescription is followed.

At the beginning of the treatment, withdrawal of

about 400 to 500 ccm. of blood is made from the elbow veins and followed by an injection of 500 ccm. of normal saline solution. Jung thinks that both procedures are indicated in every case if the pulse is small and frequent and the blood-pressure is not increased. But if the blood-pressure is very low and the pulse high, he omits the blood-letting and confines himself to a salt or Ringer solution injection. Such treatment will cause a disappearance of the eclampsia and permit the pregnancy to proceed.

There may be a recurrence, however, and if so, the author thinks that operative termination of the pregnancy is indicated. Jung has objections to most methods of intervention and advises only two: abdominal cesarean section, transperitoneal or extraperitoneal; and colpohysterectomy. He prefers the abdominal section especially when there is a contracted pelvis.

The author thinks there is special need for observation of the heart action in eclamptic patients. Even after cessation of the convulsive symptoms a diminution of cardiac activity shows a progressive intoxication. Likewise the kidneys should be observed, as eclampsia is rarely unaccompanied by albuminuria. The best treatment for the renal symptoms during the convulsive period is to preserve the power of the heart. Digitalin or diuretin can be administered subcutaneously. With the passing of the acute stage, the nephritis usually clears up.

The author deals in detail with the complications which may arise from eclampsia. W. A. BRENNAN.

Hamilton, J. A. G.: The Symptoms, Prophylaxis and Treatment of Toxæmia of Pregnancy. *Med. J. Austral.*, 1917, ii, 431.

After urging the necessity of prenatal clinics and proper maternity hospitals, Hamilton divides the toxæmia of pregnancy into: (1) pre-eclamptic toxæmia; (2) eclampsia; (3) toxæmic vomiting of pregnancy; (4) acute yellow atrophy of the liver.

The pre-eclamptic toxæmia is manifested by disturbances in the urinary, circulatory, nervous and digestive systems. Frequent albuminuria during pregnancy is of significance, and unless otherwise accounted for should be regarded as toxæmic. In doubtful cases it may be necessary to examine a catheterized specimen. The quantity is usually markedly reduced. It occurs during the latter part of pregnancy, in contradistinction to nephritis, which if present, usually manifests itself in the earlier months.

Edema, especially if it extends to the upper extremities and eyelids, and if marked in the labia as well as generally, is evidence of profound toxæmia. Blood-pressure of 160 or over and high tension pulse are suggestive symptoms. Headache when continuous and severe is a bad omen. Nervousness, irritability, insomnia, twitching and ocular disturbances are of significance, particularly the eye symptoms. Nausea and vomiting in the latter months of pregnancy as well as any gastric or

abdominal pain not connected with uterine contractions are to be regarded with suspicion.

Severe epigastric pain, like the gastric crisis of locomotor ataxia, may occur as a prodromal symptom. In order to prevent eclampsia, treatment should be instituted at the earliest manifestation of symptoms. Patients with albuminuria should be strictly confined to bed, put on a milk diet, given large quantities of water and 2 grammes of pulverized jalapa or 4 grammes of magnesium sulphate every hour until free purgation is produced. Colonic irrigations with hot saline solutions, and diuretics in the form of digitalis or diuretin may be given. Elimination by the skin should be encouraged by daily hot baths and, if symptoms threaten, a hot pack is of value.

During eclampsia the patient should be put in a quiet, darkened room, as any sudden noise or light may bring on a convulsion. While necessary preparations for delivery are being made, morphine should be given and oxygen administered, especially during convulsions. A nurse should guard the patient, and either a piece of wood or a folded towel, never a cork, should be inserted between the teeth. After the morphine has taken effect, hot packs should be given, and elimination by the bowels and kidneys encouraged, the stomach washed out and 30 ccm. of castor oil or 30 grammes of magnesium sulphate, dissolved in water, poured in and left in the stomach.

Early operative delivery gives the best results. As to the use of drugs, morphine in 0.015 gramme doses repeated sufficiently often to keep the patient in a quiet sleep gives satisfactory results. The author saw two fatalities from larger doses, 0.03 gm.

Chloral hydrate can be given in 2 or 2.6 gm. doses per rectum, repeated when necessary, as this drug is well tolerated. Veratrine is useful in cases of high tension. The full dose is 1 ccm., but 0.5 ccm. is safer. It should only be used in plethoric cases, and very cautiously if operative procedure is to be resorted to. Venesection was used before veratrine came into use.

Thyroid extract has been used by some with good results; the author finds it useful as a diuretic in the pre-eclamptic state in a few cases. Pilocarpine is a dangerous drug.

Chloroform produces lesions of the liver and kidney, and should be avoided. For anæsthesia ether or ether-oxygen should be used. Renal decapsulation is risky on account of the general poor condition of the patient, who is unable to stand the lengthy operation. Lumbar puncture has been reported to relieve the convulsions, but not to combat the toxæmia. Oxygen has been advocated by Shears as a good supplement to the usual treatment.

The author describes various methods of treating eclampsia, detailing the one followed at the Rotunda, and comes to the conclusion that the radical treatment must often be resorted to; it gives the lowest mortality. He prefers the rapid method, under

anesthesia, i. e., the vaginal or abdominal caesarean section. In multiparae the vaginal operation is that of choice, while in primiparae with a narrow vagina the abdominal is best. The danger of sepsis and mortality is greatest when preliminary vaginal examinations have been made. In such cases it is best to do the vaginal operation. Desperate cases can be saved by this rapid method. The detailed technique of the vaginal caesarean as elaborated by the author is given, as performed in 12 cases, with only one followed by a vesicovaginal fistula; this was an emergency case with no proper instruments at hand.

Toxæmic, or as it has been unscientifically called, "pernicious" vomiting, is a manifestation of the same toxæmia and the best remedy for its relief is adrenalin in three or four drop doses of 1:1,000 solution.

Hirst reports favorable results in 32 out of 36 cases treated by intramuscular injections of corpus luteum. Desiccated placenta in 0.3 gm. doses has also been tried. But if toxæmic vomiting is persistent, accompanied by progressive emaciation and small rapid pulse, emptying of the uterus should be resorted to. The rupture of the membranes generally stops the vomiting at once. An illustrative case is reported.

Pregnancy predisposes to acute yellow atrophy of the liver. More than half of the cases reported have been in pregnant women. The most distinctive symptoms are jaundice, with bile and albumin in the urine, vomiting, and coma of a varied degree. The prognosis is bad, and the only remedy is rapid emptying of the uterus. In the author's experience eclampsia did not recur in subsequent pregnancies.

L. R. GOLDSMITH.

Jefferson, J. G.: The Technique of Caesarean Section. *Practitioner*, Lond., 1917, xlix, 562.

The operation area in non-infected cases is covered with two complete layers of sterile batiste, towels and abdominal sheets. Immediately after the abdominal incision is completed and the peritoneum opened, thick Turkish toweling is clamped to its edges. One ccm. of pituitary extract is then given hypodermically. The uterus is incised as it lies in the abdominal cavity and its contents rapidly extracted. The organ is then lifted out of the wound and grasped firmly around its base by an assistant while the interior is carefully wiped out with dry gauze in order to remove any shreds of placenta or membranes which may have been left.

Next comes an essential step in the operation, namely, stretching the cervical canal in order to provide a free outflow for the lochia. This is done by thrusting two fingers of the left hand down the canal until their tips have passed through the external os into the vagina. They are now separated so as to stretch the os and rapidly withdrawn. Great care is taken in withdrawing them that they come in contact as little as possible with the internal surface of the uterus, and not at all with the edges

of its wound or with the towels. The gloves are then immediately taken off, the hands re-sterilized and fresh gloves put on.

The uterine incision is closed with interrupted catgut sutures and the organ dropped back into the abdominal cavity. Next, the upper layer of towels and batiste is removed, leaving exposed the clean, unsoiled, lower layer. The peritoneal cavity is swabbed out, the omentum drawn down in front of the uterus and the abdominal incision closed.

The main difference in the procedure employed in the possibly infected cases is that the uterus is at the outset lifted out of the abdominal cavity, and its interior swabbed out with iodine after emptying; the gloves are changed twice, once just prior to closing the uterine incision, and again after removing the soiled upper layer of towels before dealing with the omentum and the abdominal wound.

EDWARD L. CORNELL.

Crosland, G. W. K.: A Case of Caesarean Section Complicated by Rupture of the Uterus. *Brit. M. J.*, 1917, ii, 790.

Caesarean section was performed on the patient, aged 26, in April, 1913, when she was delivered of a dead child.

She again became pregnant and labor commenced; the pains were not severe. After admission to the infirmary she had only three strong pains. The abdomen was rather tender, but no uterine contractions could be felt; the temperature was normal, pulse 90, and there were no signs of collapse. On vaginal examination the head was presenting, but had not entered the pelvis; the os was patulous but not much dilated.

A laparotomy was done, the uterus being normal in appearance except that across the lower third there was a large subperitoneal hæmatoma extending into both broad ligaments. On opening the uterus toward the fundus, as soon as the knife reached the edge of the hæmatoma it encountered a large circular rent in the middle line of the organ, about three inches in diameter, obviously a subperitoneal rupture of the uterus through the lower part of the scar left by the former operation. The living child and placenta were easily delivered.

The incision in the uterus was sutured as best it could be, the rupture not being closed very effectively owing to the infiltrated and lacerated edges. A large rubber tube was passed through the cervix and left until morning to obviate any distention of the uterus with blood. The patient made an uneventful convalescence.

V. C. HUNT.

Darnall, W. E.: The Treatment of Septic Abortion. *Intern. M. J.*, 1917, xiv, 1066.

This paper is based upon 466 cases in the author's service at the Atlantic City Hospital, there were 8 deaths. Darnall believes that in the presence of an abortion the safest course of action is to curette at once, unless one can be sure that the uterus is empty.

The usual routine in the author's clinic, if pregnancy is more than three months and the infection not of a virulent type, is to do vaginal cesarean section, using the gloved finger to remove the uterine contents. If three months or under, the cervix is rapidly dilated and the contents of the uterus are gently removed with small placenta forceps. This may be supplemented by gentle curettage with a broad base curette, which does not cut, but does scrape off the tissue from the uterine cavity. There is no danger in using the sharp curette when most of the mass of tissue has been removed, if it is used with skill and gentleness.

If the cervix is fully dilated, soft gauze wound about a pair of dressing forceps or the finger furnishes an admirable method of freeing the cavity of the uterus of its contents without doing harm, thus making unnecessary the use of hard steel instruments, and creating less trauma. The uterus is then thoroughly swabbed out with equal parts of carbolic acid and tincture of iodine, the excess being taken up with alcohol. A small strip of iodoform gauze is then passed to the fundus and left in for drainage for twenty-four hours. Tight packing is only resorted to if the hemorrhage is excessive and the uterus very flabby: it provides something to contract upon.

Some severe streptococcal cases when seen very early can be saved by a vigorous injection of anti-streptococcal serum.

P. G. SKILLERN, JR.

Logan, J. C.: A Case of Superfetation. *J. M. Ass. Gen.*, 1917, vii, 158.

The patient, a girl of 16, was delivered with difficulty of a transverse presentation. The first child weighed five and three-fourths pounds. The second was about ten and one-half inches long and weighed with the placenta about seventeen ounces. The head was somewhat out of proportion to the body and the face presented a wrinkled or senile appearance. It had every evidence of being a normal five and one-half months' fetus. There was nothing abnormal in the appearance of the placenta.

There was no mummification, maceration or putrefactive changes in the small fetus such as might be found in twin pregnancy where one fetus dies and is retained in the uterus until its mate reaches full term.

The uterus was not bifid or bilobular.

EDWARD L. CORNELL.

Miller, H. A.: Pyelitis Complicating Pregnancy. *Penn. M. J.*, 1917, xxi, 145.

Pyelitis occurs with sufficient frequency in pregnant women to warrant its consideration where symptoms suggestive of its presence are found. In mild cases large doses of urotropine may be given. Free drainage of the kidney is essential, and this may be obtained at times by posture, but in the majority of cases by inserting an ureteral catheter. At times when the kidney and ureter are draining

freely, it may be necessary to permit the catheter to remain some days or weeks. In no instance, as demonstrated by the cases in point, has the prolonged retention of the catheter resulted in harm to the patient. In cases where the kidney substance has not been involved, this is followed by relief, and many times by a cure.

LABOR AND ITS COMPLICATIONS

Vivian, M.: Observations on Painless Childbirth; with Notes on Fifty Consecutive Cases Treated by the Hyoscine and Morphine Method. *Brit. M. J.*, 1917, ii, 760.

Observations on painless childbirth were made upon 50 consecutive cases by the author with the following deductions:

1. It is not absolutely necessary, as is usually supposed, for one to remain with the patient after the first dose of morphine and hyoscine is given, for by adhering to a fixed dosage and giving an initial large dose, omnipon gr. 2:3 and scopolamine gr. 1:100, followed every two hours by scopolamine gr. 1:200, provided the pains continue strong and regular, equally good success may be obtained.

2. A trained nurse is perfectly competent, in the vast majority of cases, to oversee a case of morphine-scopolamine labor.

3. The duration of labor is prolonged only to a minor degree and should not be offered as an objection to the method.

4. A quiet, dark room, with the least possible disturbance to the patient, adds to the success of the narcosis.

5. The effect of the drugs passes off quickly and the patients do not show the usual shock of labor.

Of the 50 "twilight" cases reported by the author, 30 were absolutely successful. Fourteen were restless, but did not remember anything of their labor, neither did they show signs of exhaustion. There were 3 absolute failures, and 3 multiparæ whose labors were so rapid that only one injection was made, the labor having terminated before analgesia or amnesia was established.

Of the 50 babies, 49 are alive and well. The remaining one was premature and still-born. Nine were born "blue," but only 3 of these required resuscitation; the remaining 6 breathed without undue manipulation.

H. B. MATTHEWS.

Potts, W. A.: Notes on Painless Childbirth. *Brit. M. J.*, 1917, ii, 758.

The author calls attention to the fact that the great bugbear in the administration of morphine and scopolamine for the relief of pain incident to childbirth has been an asphyxiated or stillborn child. At the present time, with a more perfect knowledge of the mode of giving these drugs, no such fear should be entertained. When such accidents do occur, provided there does not exist any obstetric abnormality that would have produced deep asphyxia or death, the blame may well

be laid to a faulty technique in the administration of these drugs. Experience, individualization, care and close supervision are required for a successful "twilight sleep."

Of the 60 consecutive cases upon which the author's conclusions are based, there were 30 private and 30 hospital cases. Of the 30 private cases 7 babies showed some degree of asphyxia and 4 of these occurred in the first 7 cases. In the 30 hospital cases there were 6 babies that were more or less asphyxiated. Three of these occurred among the first 8 cases treated. In addition to a total of 13 asphyxiated babies out of 60 cases, there were 4 stillborn. Three of these occurred in the hospital series and one in private. These, the author is certain, were not the result of the morphine-scopolamine narcosis, but were due to obstetric abnormalities that would have, in all probability, caused the same results had no morphine or scopolamine been given.

There were 3 temperatures in the hospital series, and 2 of these cases had been examined before admission. In the private series there was only one marked temperature.

There were 2 postpartum hemorrhages, one in each series, that were severe enough to require uterine tamponade.

The remaining mothers and babies did well and were discharged in excellent condition on the fourteenth day postpartum.

The author's technique was modeled after that of Gauss of Freiburg.

H. B. MATTHEWS.

Fairbairn, J. H.: Twilight Sleep in Childbirth. *Med. Press & Circ.*, 1917, civ, 470.

Fairbairn presents his conclusions from a study of 100 cases of twilight sleep:

1. There was more or less relief in 95 per cent of the cases.

2. Forty-five per cent showed complete amnesia and analgesia.

3. A general anaesthesia for the perineal stage renders the amnesia and analgesia more certain.

4. The occurrence of regular and steady pains, as elicited by the hand on the uterus, without considering the dilatation of the cervix, is the best indication for the time to begin.

5. Twilight sleep calls for greatly increased service for both the obstetrician and the nurse. The nurse should have had more obstetric training than the usual graduate. Owing to the constant vigilance on the part of the nurse, a relief nurse is usually necessary.

The disadvantages of twilight sleep are:

1. Prolongation of labor.
2. Tendency to delayed retraction during the third stage.
3. Sluggishness of the infant in starting respirations.

These disadvantages are not serious and no ill effects on the mother and child were noted during the lying-in period.

H. B. MATTHEWS.

PUERPERIUM AND ITS COMPLICATIONS

Thoms, H.: Postpartum Hemorrhage. *N. Y. M. J.*, 1917, cxi, 1669.

Thoms calls attention to the fact that the main etiological factors in postpartum hemorrhage are (1) failure of the uterine muscle to contract; and (2) laceration of some part of the birth canal.

In the treatment of postpartum hemorrhage prophylaxis is most important. Any bleeding that exceeds 16 ounces should be considered excessive and the possibility of a severe hemorrhage borne in mind. Bleeding as the result of lacerations of the cervix, vagina or vestibule should be controlled by ligature.

Intra-uterine hemorrhage may be controlled by any or all of the following procedures:

1. Kneading the fundus to maintain firmer contractions.
2. Administration of drugs, e.g., 1 ccm. of pituitrin, followed by 2 ccm. of ergotin intramuscularly.
3. The intra-uterine douche, e.g., a sterile douche of normal saline at 110 to 115° Fahrenheit, carefully given, high in the uterine cavity.

4. The intra-uterine gauze pack, which should be packed in such manner that no dead space within the cavity of the uterus remains.

In any case morphia should be given freely, the foot of the bed elevated, and external heat applied.

The author advises against the use of the commonly employed energetic methods during the third stage of labor and recommends the physiological waiting method.

H. B. MATTHEWS.

MISCELLANEOUS

Caldwell, H., and Bibb, R. H. L.: Diabetes with Special Reference to Obstetrics. *Texas St. J. Med.*, 1917, xiii, 274.

Two cases are reported. The first, aged 31, was the mother of a boy born in 1910. During her first pregnancy she suffered much from nervousness, headache, insomnia and general anasarca. Her physician took frequent specimens of urine, but reported nothing abnormal. After delivery the patient was seized with convulsions which followed one another in rapid succession. The convulsions gradually ceased, she became conscious and made an uneventful but retarded recovery. Her father suffered from diabetes of a severe type for years.

She was seen February 4, 1917, suffering from insomnia, indigestion, eructations and nervous twitchings, and in the seventh month of her third pregnancy. Examination of the urine gave seventenths per cent of sugar, no albumin, no acetone, and no diacetic acid; the specific gravity of her urine was 1.020; the output of urea 13 per ccm. and a total of solids of 46.6 per 1,000 ccm. Microscopically nothing abnormal was found. She was put on a rigid diet, which was gradually increased. On April 7 she had an instrumental delivery and made an uneventful recovery.

When first seen, the systolic pressure was 140, which was reduced to 135, but in the last month rose again to 153, with a diastolic pressure of 100, notwithstanding a change in diet and a total absence of glycosuria. The pressure rose a little higher following labor, and did not begin to fall again until the action of a saline laxative.

The second case was a secundipara, aged 27. Her first child, born prematurely and precipitately, weighed 5 pounds at birth, but lived. Her urine was not examined at that pregnancy.

On January 7 her urine contained some albumin, but was free from it on the 8th. March 28 it contained 1 per cent of glucose with acetone; however, she had been eating somewhat freely of candy. On the 29th there was neither sugar nor acetone.

April 2 she was purposely given a few peppermint creams in the morning. Her afternoon's urine contained four-tenths per cent sugar, but no acid. The following morning her urine was sugar-free. She had apparently a tolerance of carbohydrates and sweets in limited amounts. She complained of dryness of her hands, and passed about three pints of urine daily. Blood-pressure was 120 to 170.

On April 22 after two expulsive pains she was delivered of a 6½ pound boy.

EDWARD L. CORNELL.

Young, J. Van D.: Birth Trauma. *Internat. J. Surg.*, 1917, xxx, 319.

Young states that birth trauma of various degrees is caused in two ways: by rupture or tearing of the soft parts beyond their elastic limit, by a pressure necrosis of the soft parts against the bony pelvis, or a combination of both factors. The former is not under the control of the obstetrician; the latter is partially, especially in forceps delivery. As causative agents of birth trauma may be mentioned pelvic deformities, and the age of the patient. The least favorable ages are after thirty-five or before twenty years.

Uterine rupture is favored by dystocia, abnormalities of the fetus, hydramnion, rigid os, tumors, carcinoma and postoperative scars in the uterine wall. Cervical lacerations are increased in ratio by postinflammatory degeneration of the cervix, fibrous degeneration or a conical cervix. Tears of the vagina are due to congenitally small vagina and vaginal constrictions, usually found in the upper third. A fibrous hymen favors tearing at the introitus. Rapid or very prolonged labor with local

pressure favors lacerations. Forceps, and especially high forceps, produce the greatest trauma, and the author's opinion is that cesarean section is the operation of choice in cases requiring high forceps deliveries. Version increases the number of lacerations.

Emergency work should be eliminated as much as possible from obstetrical practice and the patient should be under medical observation from the earliest possible date of pregnancy. By carefully observing the condition of the patient every two weeks during gestation, the cases can be divided into four classes: normal, delayed, forceps, and cesarean section.

Delivery in a hospital insures the best care of the patient. During delivery an operating or home table should be used. The dorsal position is preferable. Nitrous oxide anesthesia shortens the first stage and leaves the patient less exhausted, with a consequent increase of muscular elasticity and lessened liability to injury. Pituitrin helps by decreasing the percentage of forceps deliveries. Cases liable to uterine rupture must be operated upon promptly, cesarean being best. The use of bags and manual dilatation will often conquer a rigid cervix and allow the head to come through without injury.

Vaginal tears are unpreventable, but should be recognized and repaired. Laceration of the pelvic floor can possibly be minimized by keeping the occiput well up under the symphysis. Rupture of the vaginal wall as a rule does not injure either the bladder or rectum, but may be accompanied by perforation of either organ.

In perineal injuries an exact knowledge of the correlation of the pelvic organs, their support, musculature and the fascial planes is very important in order to restore them properly. The author makes the strongest possible plea for the same team work in obstetrics as is now common in operative work.

Inspection and repair of trauma should be done after the delivery of the placenta. All blood clots and placental tissue must be thoroughly cleared out and the uterus kept firm by manipulation and hypodermic administrations of ergot. The author describes various operations for repairs, protesting against massed sutures and emphasizing the vital importance of reconstructive surgery founded on exact knowledge of the structures injured. The article is illustrated with pictures of lacerations.

L. R. GOLDSMITH.

GENITO-URINARY SURGERY

KIDNEY AND URETER

Caldwell, E. W.: Roentgenographic Examinations of the Urinary Tract: Review of a Series of About 500 Cases. *J. Am. M. Ass.*, 1917, lxi, 1487.

In 455 cases complete records of the roentgenographic examinations were made. Calculi were reported in 119 cases, in which 22 presented two or more calculi. In 314 cases no calculi were reported, and in 22 cases there were suspicious shadows which are reported as doubtful. The total number of calculi reported was 138.

Of the 119 calculus cases, the diagnosis in 49 proved correct, either by operation or by the passing of calculi. No case was regarded as proved unless calculi had been recovered. Of the doubtful cases, calculi have been demonstrated by operation in 2 cases and by passing of a stone in 3 cases.

Of the 314 cases in which the roentgenographic examination was reported negative for calculi, stones have been subsequently passed in 5 cases. In 2 cases stones were removed by operation. Seven cases proved errors in the series of 455 reports, a percentage of about 1.5 of error. H. A. KRAUS.

Addis, T.: The Ratio Between the Urea Content of the Urine and of the Blood After the Administration of Large Quantities of Urea. *J. Urol.*, 1917, i, 263.

In a report based on experimental and clinical work, and upon a review of the literature, Addis has done much to work out the ratio between the urea content of the urine and of the blood after the administration of large quantities of urea.

The author's summary of his work follows:

1. The ratio between the urea content of the urine and of the blood expresses the number of times by which the urea excreted in the urine during a certain period of time exceeds the amount of urea present in 100 ccm. of the blood supplied to the kidney during this time. It is the relation between the amount of work accomplished by the kidney, and the most important measure of the amount of work the kidney is called on to perform.

2. Ratios measured over periods of twenty-four hours are constant in normal individuals who have the same blood urea concentration. The normal kidney is therefore not characterized by any intrinsic tendency toward variability of function. Variations in kidney function arise from differences either in the environment or in the anatomical structure of the kidney.

3. Ratios measured over short periods of time vary widely even though the blood concentration be the same. This variation must be due to short-

lived alterations in environment which counter-balance one another over long but not over short time intervals, for it can be shown that such anatomical differences as may exist between the kidneys of young healthy adults do not play any appreciable part in its production.

4. Differences in the concentration of urea in the urine are not the cause of this variability in the ratio over short periods of time.

5. Evidence is given against the supposition that this variation arises from such alterations in the amounts of urea or of oxygen brought to the kidney as would be produced by differences in the rate of flow of blood through the kidney. Reduction of kidney blood supply below a certain minimum has a marked effect on the ratio, but it does not follow that alterations above that critical amount would have much, if any, effect.

6. Since it is possible to increase the ratio by the subcutaneous administration of adrenalin and to decrease it by pituitrin, the hypothesis is advanced that part of the variability of the ratio for one-hour periods at the same blood urea concentration may be due to alterations in the adrenalin-pituitrin balance in the blood.

7. It is shown that the magnitude of the ratio increases with increase in the blood urea concentration. In other words, the kidney responds to a call for more work by an increase in output which is greater than the increase in demand.

It is further shown that the relative variability of the ratio at different levels of blood urea concentration decreases, the higher that level rises. In other words, the greater the demand for work, the more constant does the rate of work of the kidney become.

Both of these phenomena may be brought into relation with the hypothesis of a regulation of kidney activity by means of the balance between adrenalin and pituitrin in the blood.

8. There is evidence that a direct relationship exists between the magnitude of the ratio and the size of the kidneys. This has been shown by comparing the average ratios obtained from species possessing kidneys which differ widely in size. The removal of one kidney leads to a depression of the ratio. In kidneys whose effective size has been reduced by necrosis or degeneration of varying extent, there is a relation between the degree of depression in the ratio and the amount of tissue which has been rendered functionless.

9. This direct relation between the magnitude of the ratio and the amount of actively functioning kidney tissue is only demonstrable under conditions in which the kidney is called on for the maximal

activity of all its secreting elements and is subject to the least degree of variation in rate of work. The ratio can be taken as an approximate indication of the size of the kidney only when it is determined during the strain induced by the administration of a large quantity of urea. J. D. BARNEY.

Bugbee, H. G.: A Clinical Study of Lithiasis Based on a Series of 198 Cases. *J. Am. M. Ass.*, 1917, lxi, 1492.

Of the 198 cases, 111 were males, and 87 females. Excluding the cases of calculi of the lower urinary tract, 12 of which occurred in females, there were 73 males and 77 females with calculi of the upper tract.

The relatively large number of patients past middle life presented vesical calculi as follows: aged twenty to twenty-nine, 32 cases; thirty to thirty-nine, 55 cases; forty to forty-nine, 43 cases; fifty to fifty-nine, 29 cases; sixty to sixty-nine, 28 cases.

In the formation of urinary calculi, two predisposing factors are: (1) a gastro-intestinal disturbance, and (2) disturbed drainage along the urinary tract.

Interference with kidney drainage is most often due to abnormal mobility. The mobility may be slight and still cause a kinking of the ureteropelvic junction if the ureter is fixed. Of the 77 females showing calculi of the upper urinary tract, in 51 the calculi were on the right side, in 22 on the left, while 4 were bilateral. In 39 of the right-sided cases, and 11 of the left-sided, a certain degree of mobility, interfering with drainage, could be demonstrated.

As all ureteral calculi are probably renal in origin, they may be grouped together in this consideration. In the males, twenty-eight were right-sided, thirty-eight left-sided, and five bilateral. Unfortunately, in but few of these cases was the renal mobility ascertained, but in several it was strikingly marked. One patient presented a pelvic kidney, and several others showed a well-marked prolapse. Abnormal mobility will no doubt be demonstrated more frequently in males if more careful examinations are made.

Three patients with renal calculi gave a history of injury. One patient presented a calculus with hybernephroma.

Pain is the most constant symptom of renal calculus, and was present in some form in 35 of 43 patients. In renal calculi the pain was never severe, except when the calculus was small and located in the pelvis or in a calix, so as to interfere with the urinary flow, thus increasing intrarenal tension.

A dull ache localized in the costovertebral angle was the most typical symptom, but was not constant, and was evidently due to local infection. Radiation along the course of the ureter was present in seven cases in which the calculus was located at the ureteropelvic junction. Other radiations noted

were to the opposite kidney region, the chest, the right lower quadrant, the testes, the thigh, and the entire back. Invariably the larger the calculus, the less severe the pain, and in eight cases only vesical symptoms were present. In four of these cases the kidney had gone on to almost complete destruction. Tenderness in the costovertebral angle or anteriorly in the right upper quadrant was elicited in 32 cases, and the kidney was palpable in only 18. Roentgenograms were positive in all but two of the cases of renal calculi. In these two a diagnosis of an obstruction at the ureteropelvic junction was made, and at operation a calculus was found.

Of 150 cases of calculi of the upper urinary tract, 107 were ureteral calculi, and while they were found lodged at almost every point, from the ureteropelvic junction to the vesical orifice of the ureter, 86 were lodged in the lower twelve centimeters, and 65 of these in the last six centimeters. The symptoms in these cases extended in duration from a few hours to fifteen years.

Eighty-six of the 107 cases of ureteral calculi gave a history of pain on the affected side, 4 of referred pain on the opposite side, 65 had a definite colic, and 45 had had from two to eleven attacks; 35 gave a history of having previously passed calculi.

Of the 65 cases of calculi lodged in the last six centimeters of the ureter, 56 complained of urinary symptoms.

Cystoscopic examination revealed the calculus lodged in the mouth of the ureter in 4 cases. Edema about the orifice was present in 47 cases. A deflection of the stream of urine from the ureteral orifice was noted in several cases in which the calculus was lodged in the intramural portion of the ureter. The urine showed pus-cells or blood-cells in 81 cases; was normal in 22 cases. Crystals were noted in 18 cases; colon bacilli showed a growth in 62 of 78 cases in which a bacteriologic examination was made.

In 75 per cent of the cases a definite obstruction, partial or complete, was evidenced by passing ureteral catheters and bougies. In 11 cases the calculus could be located by palpation through the vaginal vault and in four males by rectal palpation.

In 78 cases a roentgenogram was made with opaque catheters or bougies in position. A positive plate was obtained in 56 cases. The 22 patients now showing a shadow passed calculi following manipulation. These calculi were all small, and were either phosphatic or uric acid stones. A collection of crystals causing a definite colic was present in six cases. A complete obstruction was encountered in each case, and was relieved by intra-ureteral manipulation.

The author has made it a practice for the past five years to boil the catheters and bougies, thus rendering the bougie soft enough to pass through almost any kink, or to coil about a calculus. Often the tip of the bougie is bent so that it is hooked, and by passing the bougie, twisting it as it advances,

the calculus, which would often otherwise be passed by, is encircled by the bougie.

Calculi in the lower ureter may cause symptoms so like appendicitis that it has almost become routine to pass a ureteral catheter in all cases of right-sided pain.

In cases of large branching calculi the kidney may have to be split, as in two cases. The remaining cases can be relieved by pyelolithotomy.

Ninety-two of 107 calculi lodged in the ureter were passed subsequent to or removed by cystoscopic manipulation. Only fifteen were removed at operation.

Calculi should not be allowed to remain in the ureter too long.

A method which has proved successful, even in as large a calculus as the one exhibited, 3.3 by 1 cm., as to hook the end of the ureteral bougie and twist the bougie as it is advanced along the ureter, coiling it about the calculus and then applying traction.

Fifteen of the calculi removed at operation were approached extraperitoneally, and one transperitoneally.

There were two deaths among the forty-three patients operated upon for renal calculi, both caused by uremia, in bilateral phosphatic calculi.

One patient with ureteral calculus died six weeks subsequent to operation. The cause of death could not be ascertained.

In 108 cases of lithiasis there were 44 cases of vesical calculi. A definite history of renal colic, with relief of pain without passing the calculus, was given in 14 cases, and in the remaining 30 it was found that the bladder was the seat of an infection and was carrying residual urine. The cause of the retention was prostatic obstruction in the males, and cystocele in the females. H. A. KRAUS.

Macht, D. L.: The Comparative Influence of Morphine and Total Opium Alkaloids on Renal Colic. *J. Urol.*, 1917, 1, 201.

The difference in action on smooth muscle of morphine and the total opium alkaloids, of which narcotine and papaverine are the principal members, has been worked out by the author with the use of rings of ureters of pigs and other animals, and in the human. His technique is to suspend a ring of the ureter in a proper medium, i.e., urea-Locke solution, where it begins to undergo spontaneous contractions, to inscribe these on a kymograph, and to note upon the introduction of drugs into the solution the effect on the rate of the contractions and tonus of the ureter. Observations have been made also upon the laparotomized animal by intravenous injection and upon the human ureter from a case of nephrectomy.

Morphine increases the tonicity and frequency of contractions in the ureter, while papaverine or Sahli's combination of total opium alkaloids relax the tonus and decrease or even stop the contractions. The latter have an action analogous to that

of chloroform. The therapeutic value of Sahli's mixture was proved in a case of ureteral colic, when the pain was quickly relieved and no nausea was produced after morphine had failed.

H. W. PLACHEMAYER.

Geisinger, J. F.: Obstruction of the Ureter. *Ann. Surg.*, Phila., 1917, lxxi, 954.

The author states that obstruction of the ureter as an etiological generality is mentioned in all texts, but as a clinical entity it has been ignored. To detect secondary results does not require particular diagnostic ability, but to prevent such secondary results is more important. Prevention of such results is associated with the early recognition and relief of ureter obstruction. The author emphasizes very strongly the significance of chronic ureteral obstruction as a thing of itself, to be treated with the respect its symptom-producing powers demand, to be sought in possible explanation of certain clinical pictures and to be remedied as necessary.

The author summarizes as follows:

1. Obstruction of the ureter may be separated into two classes: (a) The ureteral condition is an incidental consideration, dominant pathology being elsewhere, within or without the urinary tract; (b) the obstruction itself constitutes the essential pathology.

2. The second type is that chiefly considered in this review. Some of the etiological factors are: (a) involvement of the ureter in some distant focal infection, such as tonsillitis; (b) excessive mobility of the kidney; (c) renal infection; (d) distortions of the ureter due to pelvic operations; (e) local traumatism or infection associated with passing calculi; (f) hypertrophy of the bladder.

3. Symptomatology is primarily associated with pelvic tension, with pain of so variable a character as to be confusing. Urine is often negative.

4. Conditions often simulated are chronic appendicitis, cholecystitis, lumbago, sacro-iliac disease, postoperative adhesions, neurasthenia.

5. In the presence of indefinite symptomatology, ureteral obstruction must be included among diagnostic possibilities and must be excluded before one can feel justified in removing a chronic appendix or dismissing a patient as a neurasthenic.

6. Diagnosis is made with the cystoscope and pyelogram.

7. Treatment consists of relief of the obstruction by such means as may be required by the given case.

A. C. STOKES.

BLADDER, URETHRA, AND PENIS

Walther, H. W. E.: Tumors of the Bladder. *Ann. Surg.*, Phila., 1917, lxxi, 682.

The author states that there is probably no affection coming under the observation of the urologist in which modes of diagnosis and treatment have changed so radically in the last ten years as have taken place in dealing with tumors of the urinary bladder. The

perfecting of the cystoscope and the more extensive use of this instrument in all cases of hematuria has made it possible to diagnose growths more frequently and at earlier periods. Examination of the washings of the bladder and the microscopic study of these washings has also been of great help.

The main point in the successful management of tumor cases of the bladder is an early and correct diagnosis. Very often the symptoms are not fully appreciated. The three cardinal symptoms are hematuria, pain and frequency. The author states that often patients will be sent to him with histories of hematuria of long standing. Bladder tumors are divided into benign and malignant, primary or secondary, or may be designated according to the tissue as epithelial, connective or muscular tissues.

Opinion as to the treatment of tumors varies. According to the author, all cutting operations have been disappointing and at the present time he is using the method first reported by Beer in 1910. His method was the high frequency electric current in the form of a spark cauterization applied directly to the tumor. The author also states that radium has opened a new field of treatment.

The author cites 26 cases of tumors of the bladder, their history, treatment and results, with two purposes in view, namely: (1) to show successful results of high frequency cauterization and to add commendation to the procedure introduced by Beer; (2) to show the failure of scalpel surgery in advanced malignant growths of the bladder when considered from the standpoint of a permanent cure.

A. C. STOKES.

Lewis, B. and Moore, N. S.: Vesical Diverticulum; a Report of Two Cases, with Remarks on Operative Technique. *J. Am. M. Ass.*, 1917, lxi, 1334.

In the first case reported, cystoscopy showed a diverticulum located in the left posterolateral segment of the bladder, anterior to the ureteral ridge. The orifice appeared about the size of a dime. The bottom of the diverticulum was not visible. Roentgenograms of the bladder filled with thorium solution showed a definite saculation about the size of an apple, posteriorly and to the left of the bladder, attached to it by a narrow neck.

The anterior wall of the bladder, particularly toward the left, was very thin. Narrow strips of gauze were stuffed into the diverticulum until it was quite full. The diverticulum was converted into a solid tumor about the size of a pear. The peritoneum was then stripped from the bladder wall and from the tumor. Before excising the bladder it was observed that a dense, fibrous ring surrounded the neck of the bladder. This ring was strongly dilated with a uterine dilator until it presented no further obstruction.

Two cigarette drains were placed in the pocket to the left of the bladder and were brought out of a stab wound in the left inguinal region. A retention catheter, size No. 20 French, was left in the urethra.

In the second case, cystoscopy revealed a diverticulum low down in the bladder wall. About ten yards of gauze strips were packed into the diverticulum, after which it was resected. H. A. KRACE.

Beer and Hadongue: Extraction of a Bullet Lodged in the Bladder by the Natural Route Under Control of the Radioscopic Screen (*Extraction par les voies naturelles et sous le contrôle de l'écran radioscopique d'une balle de fusil logée, dans la vessie*). *J. de méd. de Par.*, 1917, xxxvi, 212.

The case reported occurred in a soldier. Radioscopic examination showed a bullet in the bladder. The author decided to attempt its removal *per urethram* under screen control. This operation has been performed only once during the war by Legueu under different circumstances, and was successful. It was also practiced by Peck of New York.

The operation was commenced by dilatation of the canal with a No. 40 sound. Dilatation was continued until a No. 54 was passed without difficulty. A long clamping forceps was then introduced into the bladder. Under the guidance of the radioscopic screen, endeavors were made to seize the bullet. After several attempts it was finally seized by its point and extracted. The bullet was 4 cm. long and 7.5 mm. broad. It was slightly covered by a calcareous concretion, due to its long stay in the bladder. With the exception of a little hematuria and feverishness, there was no postoperative incident of importance and the patient was discharged cured.

W. A. BRENNAN.

Le Fur, R.: Autoplastic Reconstruction of a Large Urethral Loss of Substance and of an Extensive Wound of the Penis with Partial Destruction of the Glans (*Refécion par autoplastie d'une volumineuse perte de substance urétrale et d'une plaie étendue de la verge avec destruction partielle du gland*). *Paris (chirurg.)*, 1917, lx, 105.

Le Fur reports an extensive shell wound of the penis, corpus cavernosum, and the testicles, necessitating the removal of the latter. By means of a series of autoplastic operations he obtained a very satisfactory result. A fairly good æsthetic result has been obtained as regards the external genitals, using the scrotal skin. Not only the urethra but a large portion of the penile substance was reconstructed.

The most important point to which Le Fur calls attention is the regular and largely permeable canal which has been obtained, although the urethra was almost destroyed from the glans to the scrotal root. There is no threatened late stricture and after six months a No. 25 bougie can be passed easily.

Le Fur emphasizes the necessity of creating a urethral meatus of perineal derivation which should always be made in similar cases; it permits reunion of the autoplastic strips by first intention, which is impossible by the older methods, the indwelling sound or intermittent catheterization, and explains the good results of the autoplastics and the absence of stricture.

W. A. BRENNAN.

GENITAL ORGANS

Rytina, A. G.: The Verumontanum with Special Reference to the Sinus Pocularis: Its Anatomy, Histology, and Physiology. *J. Urol.*, 1917, 1, 211.

The author has made a very complete study of the anatomy of the verumontanum and its component parts, using very thin serial sections of the organs obtained at autopsies. The verumontanum is "a small, rounded, oval, elliptical or conical elevation, situated on the floor of the proximal half of the posterior urethra." It is separated from the prostate by the floor of the urethra. On the anterior surface, as a rule, are the slit-like or oval openings of the ejaculatory ducts, one on each side of that of the sinus pocularis which is generally in the midline. These structures, together with some of the prostatic ducts emptying through the verumontanum, cause the elevation from the urethral floor and make up the male uterus. Their removal would leave a smooth, flat surface, even with the rest of the posterior urethra and exactly similar to it in structure. The sinus pocularis is "an encapsulated glandular organ whose acini open by smaller or larger ducts into one grand or common duct." It is surrounded by a firm capsule from which strands of interglandular stroma run in, separate, and support the various glandular acini. That the gland is not an embryonic rest is proven by the healthy, active-looking tissue composing the glands and the avidity with which the cells take the stain. The sinus ends either in the upper part of the basis prostatae or in the urethral wall. By special staining, smooth muscle fibers, fibrous and elastic tissue, were demonstrated in the capsule and intraglandular stroma, continuous with the musculature of the prostate and ending in the muscular wall of the urethra.

The functions of the verumontanum and sinus pocularis are not known. That the verumontanum is not an erectile organ and cannot cause a blockage of the posterior urethra with prevention of regurgitation of the semen during ejaculation has been proven. It is not composed of characteristic blood spaces and its removal does not result in regurgitation of the semen. The blood supply is no greater than that of the surrounding tissue. Walker demonstrated that the verumontanum extended not more than half-way to the anterior wall of the urethra by causing an artificial erection in a human cadaver and making a paraffin cast of the urethra. It is now generally accepted that the verumontanum simply directs the ejection from the ejaculatory ducts so that it will become intimately mixed with the thirty or forty prostatic streams issuing simultaneously from the floor, sides and roof of the urethra and converging toward the colliculus. This intimate mixture is necessary to activate the spermatozoa. The physiology of the sinus pocularis is not known, though it is supposed that its thin alkaline secretion is an adjuvant to that of the prostate in fluidifying the semen. Its excision does not interfere with the fecundity of the semen.

The author does not agree with Pross that the ejaculatory ducts have an increased muscular investment which has a sphincteric action and that in the tonic or atonic condition of this muscle rests the explanation of many of the sexual phenomena, precocious and retarded ejaculation, spermatorrhea, etc. Sexual disturbances do not follow radical removal of the colliculus. A case was observed in which one ejaculatory duct opened into the sinus pocularis.

H. W. PLASSMEYER.

Pousson: Two Cases of Foreign Bodies in the Prostate (Deux observations de corps étrangers de la prostate). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1996.

Pousson says that there are only four cases of foreign bodies in the prostate reported in medical literature. One of these cases which occurred in the War of Secession was reported in 1876. In two of the four cases the projectile was successfully extracted, one by the rectal and the other by the perineal route.

Pousson relates the particulars of two cases. In the first the bullet was successfully extracted after a hypogastric section. It was situated in the median part of the prostate. In the second case a piece of shell was embedded in the tissues of the prostatic right lobe. The extraction was by the perineal route. The projectile in each case was located by radiography. Both men recovered without incident.

In the discussion Marion reported two similar cases, and Jacob another, all successfully operated upon.

W. A. BRUNNAN.

Watson, E. M.: A Study of the Vesical Orifice Following Perineal Prostatectomy. *J. Urol.*, 1917, 1, 543.

There are three groups of musculature situated at the vesicle orifice and in the posterior membranous urethra having control of the retention of urine. These are the internal sphincter and intrinsic musculature of the posterior urethra, both of which are involuntary in type, and the external sphincter or compressor urethrae in the region of the triangular ligament. The intrinsic muscles of the urethra in the author's opinion are much more important than has been generally thought. They are derived from the musculature of the trigone and consist of two layers: (1) an inner longitudinal, and (2) an outer circular layer, extending from the trigone beneath the internal sphincter as far as the openings of the ducts from Cowper's glands. These layers together with the internal sphincter are innervated from the prostatic and cavernous plexuses, inferior mesenteric ganglion and ganglia of the sympathetic. The external sphincter is innervated by branches of the internal pudic.

Wade, Hyman and others have made a study of the normal vesical orifice, and of changes in it, particularly after suprapubic prostatectomy. Radiographs of the normal orifice and after prostatic

hypertrophy, using a 5 per cent solution of collargol, show the internal sphincter as the point of closure. After suprapubic prostatectomy the external sphincter forms the point of bladder closure in the majority of cases, the internal sphincter having been destroyed or rendered useless. The internal sphincter remains a patent ring showing a small pouch present at the site from which the prostate was removed continuous with the bladder cavity.

In twenty-five cases of perineal prostatectomy the radiographs with a 10 per cent thorium solution in the bladder showed in no instance a permanent dilatation of the internal sphincter. One interesting case with a very adherent median lobe and deep prostatic orifice established continence twenty months after operation, the trauma incident to the operation probably explaining the long interval. The internal sphincter, although traumatized both by the hypertrophy and operation, returns to normal in a carefully done perineal prostatectomy.

Cystoscopic changes in *tabes dorsalis* are analogous to those in suprapubic prostatectomy. Here to a varying degree, according to the nervous involvement, more and more of the intrinsic musculature becomes useless, until a funnel-shaped posterior urethra results and incontinence begins. In this disease the involuntary nerve fibers are destroyed, while the motor branches to the external sphincter are uninvolved. From his findings the author believes that the internal sphincter and intrinsic musculature of the posterior urethra are the controlling factors in the retention of urine and that the question of continence would seem to rest on the preservation of these involuntary muscle fibers.

H. W. PLAGGEMEYER.

MISCELLANEOUS

Young, H. H., and Frontz, W. A.: Some New Methods in the Treatment of Carcinoma of the Lower Genito-Urinary Tract with Radium. *J. Urol.*, 1917, i, 505.

Young and Frontz report several series of cases of carcinoma of the lower genito-urinary tract treated with radium radiations. By means of special apparatus it was possible to introduce a platinum capsule of radium into the rectum, urethra or bladder, map out the area to be radiated, and absolutely control the amount given. This internal use of radium with accurate methods of control and fixation has proven to be more productive of good results than the employment of large amounts externally.

External treatments of large amounts of radium to the lower abdomen, perineum or sacrum gave no relief if used alone. Close apposition of the radium to the tumor seems absolutely essential.

Cancer of the prostate and seminal vesicles responded well with relief of such symptoms as dysuria and frequency, and with reduction in size,

disappearance of induration, and absorption of infiltration. In no case with complete retention or pains in the hips, thigh and back, due probably to metastasis, was there any relief. Sections taken in cases coming to operation showed extensive shrinkage and degeneration of the cancer cells. By changing the position of the radium capsule it is possible to prevent rectal irritation. Evidence of rectal irritation is manifested by frequent desire to stool, burning discomfort and discharge of mucus which may be tinged with blood.

Radiation of the malignant papilloma type of bladder tumor gave excellent results. Types of papillomata showing a histologic malignant change in the periphery showed no response to fulguration alone, but disappeared completely when fulgurated following radiation. Malignant tumors with definite infiltration of the bladder wall, as demonstrated either by cystoscopy or by palpation, showed no improvement under the use of radium.

The authors believe that in radium there is a potent agent capable of producing marked changes in malignant tumors and that in some cases there may be a complete cure, although more time must elapse before accurate final determination can be made.

H. W. PLAGGEMEYER.

Baker, T.: Genito-Urinary Causes of Low Back Pain. *Am. J. Orthop. Surg.*, 1917, xv, 819.

Pain in the lower back frequently radiating down the legs may be due to renal and ureteral lesions. Hunner observed a case of stricture of the lower part of the ureter in which the chief complaint was pain over the sacro-iliac articulation, and the patient was relieved at once by dilatation of the stricture. Young describes backache associated with inflammation of the seminal vesicles. He noticed pain in the back, sacral, lumbar and gluteal, in six cases, and pain along the sciatic nerve in three cases, as one of the earliest symptoms complained of in 111 cases of cancer of the prostate. The pain in these cases is due to the pressure on contiguous nerves. As a point of differential diagnosis it may be stated that pain on motion and limitation of motion is characteristic of lesions of the bone and ligamentous structures of the lower back, while these signs are absent or not so marked when the backache is of genito-urinary origin.

In many instances the X-ray will reveal the nature of the bony lesion while the same may be palpated. Appliances for the support of the pelvic bones will usually give quick relief from pain, whereas they will be of no service when the pain originates in the male pelvic organs. The author has met 41 cases of pain in the back of genito-urinary origin in a series of 146 cases of chronic prostatitis and spermatoecystitis seen in private practice. Pain radiating along the sciatic nerve due to cancer of the prostate is usually very severe. There is great need of more co-operation between the orthopedist and the urologist in definitely locating the cause of these pains of uncertain origin.

J. J. KURIANDER.

De Sord, J.: *Reparatory Surgery of the Genito-Urinary Organs* (*Chirurgie réparatrice des organes génito-urinaires*). *Arch. de méd. et pharm. mil.*, Par., 1913, livII, 239.

The plastic surgery of mutilations of the genito-urinary organs differs from that of other organs inasmuch as the functional results are of much more importance than the aesthetic. It requires a long period of preparation as well as a long period for the repair. The first includes the disinfection and cicatrization of the wounds. The course of the urine must be deviated in almost every case. Hypogastric discharge is preferred by the author because it is more regular than perineal and better borne by the patient.

The author reports four extensive penile mutilating wounds treated by him.

The first case involved a transverse wound of the penis 2 cm. above the penoscrotal angle with complete section of the urethra and the right corpus cavernosum and a partial section of the left corpus. The superior stump was edematous and gangrenous and was only attached to the inferior stump by the skin of the dorsal face. The period from May until October was occupied in disinfection, cicatrization, and the removal of small shell fragments. In October external urethrotomy was done. From December to January plastic repair operations took place.

In the second case, there was almost complete destruction of the inferior face of the glans. The superior and dorsal face of the glans was completely

open, the wound dividing it into two unequal parts. The left testicle was missing. The period from July to the middle of August was given to disinfection after suprapubic cystotomy. Cicatrization resulted in a deformed gland in two segments, with a large loss of substance of the lower urethral wall. The repair operations lasted until the end of October.

The third case showed almost a complete destruction of the penis. At the lower part of the gangrenous stump there was a large wound extending toward the lower part of the scrotum, only the right part of which remained. This wound spread into the thigh and buttocks. Disinfection and cicatrization with suprapubic drainage extended from July until the middle of September. September to October was occupied by repair operations.

The fourth case involved the section of the penis and the destruction of both testicles. A piece of furrowed skin was the only vestige of the penis left. Cystostomy with hypogastric deviation of the urine was necessary from November until January. The period from January to February was occupied by plastic operations.

The plastic repair operations in these four cases consisted generally in dissecting vicious scars, finding the remnants of the urethral passage, and then reconstructing the parts as far as possible. In all four cases the result of the plastic operations was to establish normal micturition, and in three cases ejaculation and erection were re-established. Illustrations of the repair procedures are given.]

W. A. BRENNAN

SURGERY OF THE EYE AND EAR

EYE

Donohue, W. D.: *First Aid in Eye Injuries*. *North-west Med.*, 1917, xvi, 334.

The purpose of this paper is merely to present in the briefest possible manner some of the more common injuries to the eye and its appendages, the remedies to apply, and how to apply them by the first one to whom the victim may have access following his injury. To be able to successfully treat a given part of the human body in case of injury, one must of necessity have some knowledge of its anatomy, and there is no organ of the body where this is so essential as in the case of the eye.

For safety in guiding the treatment, one must know the cornea from the sclera, the iris from the ciliary body, the aqueous humor from the crystalline lens, and the relative importance of each structure to the integrity of the organ as a whole. For instance, an incised wound of the cornea may not be fatal to vision, even though the aqueous escape, nor a similar wound in the sclera destructive through loss of vitreous, but a wound apparently of slight moment at the junction of the cornea and sclera may prove rapidly destructive to both vision and eye on account of injury to the ciliary body which is situated immediately beneath this point.

Of minor injuries of almost hourly occurrence, and more abused than all other injuries combined, is the foreign body in the cornea. The first-aid man in these cases should work with artificial light and condensing lens, definitely locate his foreign body, anesthetize the eye with a 4 per cent solution of cocaine, and when certain of complete anesthesia, attempt its removal with a small piece of cotton twisted tightly around the end of an applicator, and placed directly on top of the foreign particle. Then by rolling the applicator between the thumb and finger, it becomes entangled in the cotton and is lifted from its bed. This is not always successful with particles in the cornea, especially if they are deeply imbedded or smooth of surface, but it never fails to catch them from the conjunctival sac. Should this fail, carefully lift the offending body out of the cornea on the point of a needle or a cataract knife, but never scrape off the corneal epithelium, which opens up a region for infection.

Following this simple injury the eye should be tied up for twelve hours, and if there is pain and redness, a drop of a 1 per cent solution of atropin sulphate should be instilled as soon as the operation is over.

Following the use of cocaine for any purpose whatever, the eye should be bandaged for at least three hours to allow the passing of the tendency to

separate the epithelium from its attachment to the cornea.

Burns of the cornea and adjacent tissues from lime, hot slag, molten lead and various acids are not uncommon accidents, and while exceedingly painful, are not always as destructive as the amount of suffering would lead one to believe. At other times, however, a very harmless appearing burn will not only destroy the eye but the socket as well by the scar tissue it leaves behind. The first treatment of these injuries should consist of cleansing the eye carefully of all offending material and dressing it with a liberal quantity of plain, sterile vaseline inside and outside the lids, and covering with cotton in preference to gauze.

In case of great loss of tissue by burning from any agent, first-aid measures should be applied according to one's best intelligence until the case can be turned over to someone with more experience. For all purposes where irrigation is necessary, a saturated solution of filtered boracic acid will meet all requirements and is probably as strong an antiseptic as should be used about the eye for any but some special reason. No remedy should be used in the eye without positive indication for that particular remedy. If no drug is indicated, the eye will be better if left alone.

In cases of incised or penetrating wounds of the cornea, it is vitally important to see them early and to study carefully the position of the wound in relation to the pupil. If it be in the center, directly over the pupil, atropin is indicated to prevent incarceration of the iris in the wound, which it will do in most instances if the remedy be used early enough and in sufficient quantity to thoroughly dilate the pupil. If the injury be situated at or nearer to the corneoscleral junction, eserin solution is the obvious remedy, and, like atropin, if it is to be of any use, it must be applied soon after the injury. If the wound is large and gaping, it should be closed by careful suturing, keeping the sutures as far as possible from the center of the pupil. Small wounds in this region will take care of themselves under carefully closed lids and a gentle pressure bandage.

Scleral wounds should be sutured under careful asepsis and with scrupulous attention to the coaptation of the wound margins. As in closing a wound in any region, one must first exclude the presence of a foreign body, and in this case none but the finest sutures and the smallest needles should be employed.

In wounds of the lids it is most essential to do whatever repair work is found necessary as soon as possible after injury, for in this region almost any

kind, shape or size of wound will heal promptly if the apposition be good and the case seen early enough. This work is of vast importance to the victim; for, should the eye itself be lost, it is the more necessary that the lids should not be deformed.

The man in general practice is frequently called upon to render first aid in some of the more common varieties of very acute troubles of microbic origin, and while he accepts them as emergencies only, he should constantly bear in mind that all severe, acute, conjunctival infections, in the stages of invasion, are so nearly alike, clinically, that the only positive means of making a diagnosis is the microscope. If a violent acute conjunctivitis is found in an individual who has an acute specific urethritis, one may suspect the presence of the gonococcus in the eye. Or, if one of the school children shows an eye that is red, painful, intolerant of light and full of secretion and says that the other children at home have or have had the same thing, one may reasonably suspect a case of pink eye. But the safe way is the smear, the aniline stain which all of these organisms take, and the microscope.

In the newborn the judgment of the first-aid man will be severely taxed, when about the third day his attention will be called to the presence of pus in the corner of the eyes and he finds it necessary to decide whether he has to deal with the coccus of Neisser or the pneumococcus, streptococcus, diplobacillus, bacterium coli or some variety of staphylococcus, any of which may be the causative factor in ophthalmia neonatorum. As a rule, however, if the gonococcus is not present, the pneumococcus is, the gonococcus prevailing in about 70 per cent of these cases. While attempting to determine the bacteriology of their infection, he will do well to start treatment at once, and the surest of all remedies is silver nitrate in a per cent solution, painted on the mucous membrane of the everted lids once in twenty-four hours. The conjunctival sac should be carefully irrigated with saturated boric acid solution every hour for the remainder of the twenty-four. The lid margins should be anointed at frequent intervals with plain, sterile vaseline to prevent sticking and retention of pus.

In discussing the afflictions of early life, it is worth while to call attention to the subject of squint of any variety which may be brought to the notice of the general practitioner, and to suggest that this is not an affliction to be neglected, for a squinting eye, if unattended, is doomed to more certain blindness than is a case of injury from external violence. The process is slow and insidious and the victim has no warning of danger to sight until central vision is gone and the eye, as far as useful vision is concerned, is lost. Nearly, if not quite all,

cases of non-paralytic squint, if taken early enough, can be remedied by careful refraction and properly fitting glasses. Parents of squinters should be advised accordingly and should never be told to wait until the child starts to school or to let it go entirely and allow him to outgrow it; this he probably would do, but would lose an eye in the outgrowing process.

EAR

Emerson, F. P.: *Changing Methods and Advances in the Treatment of Progressive Deafness from Chronic Secretory Otitis Media*. Boston M. & S. J., 1917, clxxvii, 583.

The author's conclusions are as follows:

1. Every case of chronic progressive middle ear deafness has a primary focus, which persists as a low-grade infection, subject to acute exacerbations. In chronic cases such foci are usually multiple.
2. This primary focus is usually constant for the individual, and is indicated by the location of exacerbations.
3. Every case showing variable hearing can usually be improved to the standard of the best hearing in that particular case.
4. So-called cases of nerve deafness of non-specific origin are in the experience of the author due to toxæmia from some definite focus.
5. Inflation in chronic cases is unscientific and harmful as a routine, as the tube is already open and has partially lost its tone in the majority of cases. In those cases where the tube is not open, it does no good to remove the obstruction.
6. Nasal obstructions have no harmful effect upon the middle ear unless infection is present. Such obstructions, however, are the primary cause in the development of imperfect drainage, which predisposes to infection, and which is always present in cases of chronic secretory otitis media originating in the nose.
7. Foci, whether in the sinuses, tonsils, mandible or epipharynx, are potential factors in the progress of chronic progressive otitis media, either by direct extension or through the lymph and blood streams.
8. No hearing test will forecast the improvement in a given case as long as the Rinne test is positive with variable hearing.
9. Whatever the macroscopic appearance of the membrana tympani, the cause of the deafness is active for a long time outside the middle ear as a toxæmia or low-grade infection subject to acute exacerbations.
10. Constitutional diseases have but little effect upon the course of chronic secretory otitis media, except to lower the patient's resistance and make him more susceptible to exacerbations of his localized focus or foci.

OTTO M. ROTT.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Ferreri, G.: Malignant Papilloma of the Nose and Right Maxillary Sinus (*Papilloma maligno del naso e del seno mascellare di destra*). *Polichin.*, Roma, 1917, xxiv, ser. chir. 353.

Ferreri reports a case of nasal malignant papilloma in a man of 42 years. The nasal tumefaction spread to the right maxillary sinus which with the ethmoid was completely opaque to the diaphanoscope. The tumor originated from the right naris. The author operated by Durante's method for superior maxillary resection and removed the greater part of the spongy mass of the tumor from the right nasal fossa, and also removed the anterior walls of the sinus and the orbital floor with the scalpel and Gigli saw. The tumor mass filled all the antral cavity and extended upward toward the ethmoid and the internal orbital angle.

The author reviews the literature of nasal papillomata since Michel reported the first case in 1876. There are two varieties: the soft papilloma; and the true or hard papilloma, the latter including the true fibro-epithelial tumors. The recorded number of the latter variety is small. From the histological description the case reported by Ferreri belongs to this class of tumors.

The author believes that such tumors have an ethmoidal origin. As regards statistics of malignant nasal tumors, Finner found 10 cases of nasal sarcoma and 2 of nasal carcinoma in 28,000 patients. In 449 cases of sarcoma and 554 of carcinoma Gurtl found 15 of the former and 4 of the latter nasal.

It is evident that primary carcinoma of the nasal fossae is rare. It is generally found on the septum, especially on the anterior part, according to Kummel, although Tissier finds that the ethmoidal labyrinth is more easily involved.

W. A. BRENNAN.

Goddard, H. M.: Deviation of the Septum and Submucous Resection. *N. Y. M. J.*, 1917, cvi, 368.

Goddard reports his successful treatment in many hundreds of cases of the common nasal deformity, septal deviation, by its most suitable corrective remedy, submucous resection. The object of the operation is to restore to as nearly a normal state as possible those functions which the nose is endowed with. To rectify breathing errors, to substitute a well-formed for an ill-shaped nose, to avoid possible facial despoliation, as well as to overcome complicating diseases of local or systemic nature, is the ultimate aim.

Before attempting alleviation or cure, it is es-

sential that the physician be well acquainted with the physiologic and anatomic pathology of the nose incident to septal deviation. In the author's opinion, trauma during childhood is probably the most common cause contributing to the production of this condition. The many complications and sequelae such as ethmoidal, frontal, and antrum disease create many unpleasant symptoms in the form of nasal fullness, pain, headache, vertigo, etc., and sometimes even remote reflex disturbances.

The author defers operation for septal deviation until the patient has attained adolescence or early adult age. Only those deviations that are obstructive demand operation, and the operation of choice, because of its uniformly good results, is submucous resection. If properly performed, it is ideal. The discomfort to the patient is practically negligible, no mucous membrane is destroyed, danger to the turbinates is averted, and no redundancy or resiliency of tissue is noted. The conserving effect of this operation promises a re-establishment of normal physiologic nasal processes in the sense of proper tissue function, nasal ventilation, and nasal drainage.

The author's technique, briefly stated, requires proper anesthetization of the mucosa overlying the septum as well as depletion of the peripheral vessels through the local employment of 20 per cent cocaine solution and 1:1,000 adrenalin chloride solution, for about 15 to 20 minutes, followed by the injection of a 2 per cent solution of novocaine at the junction of skin and mucosa. Then an incision is made at the junction of the skin and mucosa, starting high and extending down into the floor of the nose. This incision is made deep enough to expose the glistening cartilage. A few rapid strokes with a Carter curette separates the mucosa from the cartilage. An incision is next made through the cartilage to the basement membrane of the opposite side, and with the Carter instrument a rapid dissection is again made as on the first side. With the membranes of both sides thus freed, the cartilage is engaged between both blades of a nasal speculum. A nick in the cartilage is then made with pointed scissors as high up as required to remove the deviated portion. The incision in the cartilage is continued with a small swivel knife, and with the speculum still in place, all deviated portions are removed. The flaps are replaced and retained in position by a Simpson sponge splint on each side. The following day all dressings are removed and the patient is thereafter seen daily until complete healing has occurred.

The two chief complications during operation encountered by the author are hæmorrhage and

perforation. The former is usually controlled by the application to its site of adrenalin chloride packing; the latter is let alone, no attempt being made to close it. The main sequelae to the operation are hematoma, abscess of the septum, infection of the eustachian tube, sinking of the nasal bridge below the nasal bones, and acute ethmoiditis. Infection is apt to occur despite every precaution taken.

Kaempfer, I. G.: Nasal Septum Deformity in Children. *Laryngoscope*, 1917, xxvii, 868.

The youngest child was five weeks old, the oldest seven years. The majority of the children ranged in age from two months to four years. There were 99 children in the first year of life, 42 under six months, and 57 between six and twelve months old. Between one and two years of age there were 57 children; between two and three, there were 38; from the fourth to the fifth year, there were 4 children and one each in their sixth and seventh years. Of the total, there were 49 per cent of septal deformities, 20 per cent of frank deviation, and 30 per cent of septal thickenings. As an evidence that the thickened septa were but forerunners of frank deviations later on, are cited the following statistics:

In the first year the proportion of true deviation is 8 per cent and in the fourth year 55 per cent. The thickened septa which are 25 per cent in the first year and 45 per cent in the second, fall to 32 per cent in the third and 15 per cent in the fourth year.

Less than 5 per cent of the total cases with deviation had hypertrophied inferior turbinates. About 4 per cent had hypertrophy of the middle turbinates.

The following statistics deal with the relationship of septal deviations to hypertrophied tonsils:

Of the 108 children with septal deformity, 85 per cent had hypertrophied tonsils. Of 112 children without septal deformity, 77 per cent had hypertrophied tonsils. Of the 180 cases of hypertrophied tonsils, 53 per cent had septal deformity, while of the 27 cases with small tonsils, only 18 per cent had septal deformity.

The author believes that hypertrophied tonsils and septal deformities have a common etiological factor and that factor seems to be the chronic rhinitis. A vicious circle is started beginning with the narrow nose, which causes rhinitis, and this in turn causes increasing growth of tonsils and adenoids.

The latter increases again the rhinitis, which in turn aggravates the septal deformity.

OTTO M. ROTT

THROAT

Sterckmans, C.: A Case of Intrinsic Cancer of the Larynx: Tracheothyrotomy: Total Laryngectomy (Relation d'un cas de cancer intrinsèque du larynx; trachéo-thyrotomie; laryngectomie totale). *Arch. méd. belge*, 1917, lxx, 605.

A soldier developed acute laryngotracheitis from exposure. Later a subglottal polypus was diagnosed with paralysis of the vocal cord. Two years after commencement of the disease the man's condition necessitated a tracheothyrotomy, and two small tumors were removed from the region of the glottis and a tracheal cannula inserted. Examination of the tumors showed them to be an epithelioma. Rapid growth however occurred and the author decided on a total laryngectomy, following Sebileau's technique.

The postoperative course was satisfactory except for slight fever during the first three days. The man was up and about one month after operation and his general condition was excellent.

After laryngectomy patients who succumb generally do so within the first five days after operation. Careful and continuous postoperative attention is required both as regards hospitalization, feeding, dressings, etc.

The most interesting point in this case is the extraordinary rapidity with which the tumor developed after it had remained quiescent during more than two years. The impetus given to the cancerous tumor by the tracheothyrotomy and the probably incomplete removal of the tumor explains the recurrence of the development after the first intervention. It is also known that aveolar epithelioma habitually has a very rapid progress.

Regarding the technique followed, i.e., exolaryngeal laryngectomy, the author thinks that there is an exaggerated apprehension concerning it. The operation is delicate and the mortality high, 20 to 25 per cent.

The author thinks it is perhaps unique in the annals of laryngectomy that within seven weeks in the same patient under unfavorable circumstances a thyrotomy should be followed by a successful total laryngectomy. The case bespeaks radical rather than palliative operative treatment when it is a question of a malignant tumor of the throat.

W. A. BRENNAN.

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SURGERY OF THE HEAD AND NECK

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SURGERY OF THE EYE AND EAR

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SURGERY OF THE NOSE, THROAT, AND MOUTH

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Treatment of carcinoma of the tongue with radium. F. G. DYAS. *Surg. Clin. Chicago*, 1917, i, 1301.

INTERNATIONAL ABSTRACT OF SURGERY

MAY, 1918

ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

Ochsner, A. J.: Postoperative Treatment of Surgical Cases. *Illinois M. J.*, 1918, xxxii, 20.

After the author emphasizes the importance of certain pre-operative measures, the following rules for postoperative treatment are mentioned and discussed:

Hot water by mouth and proctoclysis is given directly after the operation.

Gastric lavage is indicated for abdominal distention, nausea or vomiting.

An ice coil over the cardiac region is used for high fever and for a rapid pulse; for the latter also give a normal saline transfusion.

Bronchial irritation is alleviated by elevation of the head of the bed 12 to 18 inches and by proctoclysis and normal saline transfusion. This is also effective for peritonitis or pain; the therapeutic lamp should also be suspended over the abdomen.

Transfusion of whole blood is indicated for extreme shock.

With the exception of peritonitis and all operations on the gastro-intestinal tract, a soap suds or normal salt enema should be given and castor oil on the tenth day. Broth, beef tea or gruel should be given on the third day.

The patient should never be moved to the dressing room unless in good physical condition.

Patients should never be left lying on a cart in the hall waiting for operation or dressing.

When hemostats are left in the wound, they should be loosened on the second evening and removed the following morning. Superficial sutures should be removed on the sixth day, deep ones on the twelfth to the fifteenth day.

Gastrectomy, prostatectomy and mamnectomy drains should be removed from the second to the fourth day; gall-bladder tampons on the fifth day; cholecystectomy and appendectomy tampons on the seventh to the tenth day; vaginal tampons in

clean cases on the fifth day; endometritis cases on the second day.

No drugs should be given except after consultation.
H. H. FREILICH.

Jones, H. W.: After-Care in Abdominal Operations. *N. Y. St. J. Med.*, 1917, xvii, 458.

If the patient recovers quickly from the anæsthetic and vomits or shows signs of restlessness, one-sixth of a grain of morphine sulphate is given hypodermically. If the patient sleeps out of the ether, this will not be necessary until later. Rectal saline, one pint, is administered slowly before the patient recovers from the anæsthetic, or immediately after. Water, either hot or cold, as best tolerated, is given as soon as the patient asks for it.

If vomiting persists after twelve hours, one dram of sodium bicarbonate in six ounces of lukewarm water is given. This washes out the stomach and usually results in cessation of vomiting. Only rarely does it become necessary to resort to the stomach tube. When the soda solution is retained, it is useful in overcoming acidosis. In any case, bicarbonate of sodium in doses of twenty grains every three hours is helpful for the first two or three days. It not only overcomes the acidosis, but appears to have a favorable influence on the gas pain.

In nearly every case the author orders morphine sulphate, one-sixth to one-fourth of a grain hypodermically every four hours, if occasion requires, for the first two days. In over 200 cases it has never been necessary to use more than one and one-half grains for any one case.

A cathartic need not be administered until the third day. If the patient is made very uncomfortable by gas distention, soap suds enema may be given. If this fails, a high enema, containing one ounce of magnesium sulphate, one ounce of glycerin, and four ounces of water may be used. Occasionally

turpentine is added. Cathartics are not given by mouth until the third or even the fourth day. Morphine and antacids can be depended upon to relieve the gas pain.

To insure a rapid convalescence, sleep is essential during the stay in the hospital. If the usual sponge baths and hot drinks at bedtime do not accomplish this purpose, bromides and hyoscyamus or some of the coal tar sedatives should be used. The conservation of nervous energy determines a favorable outcome in many cases. EDWARD L. CORNELL.

ASEPTIC AND ANTISEPTIC SURGERY

Canestro, C.: Treatment of Large Septic Wounds by Means of Irrigation with Capillary Drainage (Cura delle grandi ferite settiche mediante irrigazione con drenaggio capillare). *Polichin*, Roma, 1917, xxiv, 102. *publ.*, 1957.

In treating septic wounds, Canestro has modified the Carrel method by substituting strands or ropes of cotton instead of rubber tubes. These cotton strands run from a reservoir filled with antiseptic placed above the patient, then traverse the furrows of the wound and emerge and drain into a lower receptive vessel. If the cords are not long enough to traverse the wound, then a double set may be used, one set from the antiseptic to the wound having an afferent function and the other set having an efferent function from the wound to the drainage receptacle.

The author's method is based on his observations that if two vessels be taken, both containing hypochlorite solution with a difference of level between them of about a meter and then connected with filiform strands, the fluid will pass from the upper to the lower vessel with a velocity equal to about 140 ccm. per hour, the velocity increasing or diminishing according as the distance between the vessels is increased or diminished. Also, if in one vessel a hypochlorite solution is placed, in a second vessel some organic fluid such as purulent hæmatic serum and in a third water, and if the three vessels are put in communication by the cotton strands, it will be seen that the hypochlorite solution passes into the second receptacle, and from thence mixed with the purulent fluid it passes into the third.

The author shows how the method may be applied in different classes of wounds and gives 10 illustrative cases treated by him, in 9 of which the infective process was overcome. He claims that the cotton strands provide a more efficacious drainage than rubber tubes and are less costly. W. A. BRENNAN.

Haycraft, J. B.: The Treatment of Gunshot Wounds with a Solution of Soap and Water and Primary Suture. *Brit. M. J.*, 1918, 1, 80.

The solution used is pure *sapo durus*, 1 part, obtained in blocks and cut into shavings which are dissolved in hot water, 20 parts, previously boiled. When used, it is mixed with an equal volume of sterile water.

Superficial wounds are completely excised and soap solution well rubbed into the surface and the wound stitched up. In single penetrating wounds the skin wound is completely excised and the track of the missile laid open and the surface of the track cut away. Foreign bodies are removed, vessels ligated and the wound swabbed out with soap solution. Muscles and fasciæ are closed with catgut and the skin sutured. Seton wounds are treated the same way, at the entrance and exit wounds. If there is much destruction of muscle tissue the skin is sutured over the wound and a small rubber split tube put in for one or two days. Amputations have been completely stitched up with a very small split tube in one angle for twenty-four hours. Penetrating wounds of the knee-joint have been completely excised down to the synovial membrane, the joint irrigated with soap solution and the wound closed in layers.

The effect of the soap solution seems to be hæmostatic. The total number of cases is 116. Out of 98 cases in which the result was observed, 91 eventually healed and 7 failed altogether. Out of 38 compound fracture cases, 33 eventually healed and 5 failed. In some cases there was a little oozing or superficial suppuration necessitating the removal of one or two stitches. Four charts are appended and two tables are given.

The conclusions are as follows:

1. Soap solution easily permeates and comes into contact with the whole surface of the wound. It acts as a mechanical cleansing agent, washing away all débris.

2. Complete excision of a wound leaving an aseptic surface is possible only in superficial wounds and in superficial muscular wounds. It is impracticable in deep penetrating wounds, compound fractures, etc., on anatomical grounds, and it would also entail a much freer removal of tissue, which may impair future functional results. These latter cases when treated by soap solution and primary suture heal better than if an antiseptic such as *eusol* or *bipp* had been used. It follows from this that the tissues themselves are able to deal successfully with any infection which is left behind without the aid of an antiseptic. This point is particularly exemplified by those cases in which there is at first an intense local reaction following the operation; it subsides as the tissues gain the upper hand.

3. Success depends on getting cases within a few hours after the wound was received, before infection progresses far into the adjacent muscle, on the thorough removal of dead or grossly damaged tissues, and the localization by X-rays and removal of any foreign body that may be present.

4. Compound fractures of the upper extremity practically always do well; only 3 cases of fracture of the femur have been thus treated, and of these 2 were successful, but the number is too small to warrant a definite opinion. It is necessarily the most severe type of case one has to deal with, but

the results of these cases have been distinctly encouraging.

5. The advantages of primary suture are obvious: (a) easy, rapid, and painless dressings; (b) time is saved for everyone once the patient has left the operating theatre; (c) it is economical. The time taken in the operating theater is, however, considerably longer, and this generally forbids the use of the method when the pressure of work is high.

6. One of the most important points is that no severe injury which has been stitched up should be evacuated for at least a week, first, because it may just turn the balance during the early days of local reaction when the tissues are getting the upper hand and cause failure; and, secondly, because when it is very difficult to decide whether the case should be opened up or not, the operator himself is in a much better position to judge what is likely to be taking place inside the wound he has sewn up than someone else who gets the case later; consequently stitches remain in which might otherwise be taken out.

7. No opinion can be given as to the ultimate functional result, as to bony union and the action of muscles.

In those cases in which primary suture has been out of the question owing to gross loss of tissue, after the usual operative procedure soap pack has been used after the manner of the salt pack. It has been left in as a rule for five to seven days, and when taken out left a beautifully healthy wound.

CARL R. STEINKE.

Gurd, F. B.: Potassium Permanganate in the Treatment of Anaerobic Infection of Wounds.
J. Roy. Army M. Corps, Lond., 1917, xxix, 202.

The author thinks that unless adequate operative and mechanical treatment of wounds infected with the bacillus aerogenes capsulatus is carried out, no antiseptic employed as a dressing will be of value. Prevention and control of infection by this bacterium is extremely important for surgeons working in casualty clearing stations.

In the author's hands potassium permanganate solutions in dilutions of from three to one-half per cent have proved more effective in the prophylaxis and treatment of wound infections by the gas-producing group of anaerobes than other preparations. It should be used whenever an infection has commenced, and in all extensively lacerated wounds, especially if accompanied by bone comminution or injury to important vessels.

The author gives his reasons for the selection of potassium permanganate: (1) it is cheap; (2) it is a powerful oxidizing agent; (3) it is an effective germicide; (4) it is astringent; (5) it does not macerate epithelium, etc.; (6) it is a mild irritant and stimulates blood circulation; (7) it causes little pain; (8) it induces the prompt appearance of healthy granulation; (9) it does not stain the tissues.

The results in a large group of cases have been uniformly good.

W. A. BRENNAN.

Emerson, M. L.: Bismuth Iodoform Petrolatum Paste in the Treatment of Recent Wounds.
J. Am. M. Ass., 1918, lxx, 79.

The author describes this paste chemically, states the technique of application, and cites cases illustrative of results obtained from its use.

The paste consists of iodoform 2 parts; bismuth subnitrate 1 part; and liquid petrolatum sufficient to make a suspension. To this mixture may be added three grains of thymol, rendering it odorless, but not changing it chemically. Thymol, one-half dram, may be added to a five-yard package of iodoform gauze, to render it odorless. Hands, instruments or containers washed in turpentine or mustard water will lose the odor of iodoform.

This mixture has been used in fresh war injuries and the author strongly advocates it after using it in a long series of hospital cases.

The paste is rubbed thoroughly into the wound with a piece of gauze until it is intimately embodied in the wound, surface and edges, and the entire raw surface is studded with crystals. Surplus paste is then wiped away, and the wound edges coapted firmly until hæmorrhage ceases. In scalp wounds an occasional vessel will have to be crushed or twisted, and better success is reported if hæmorrhage is controlled in this way. No catgut should be used. In this class of cases the results have been particularly satisfactory, practically no complicating infection occurring since its use.

In face wounds, approximation is attained by horse hair suture. Coaptation is also effected in some cases by the use of narrow adhesive strips. Dressings are avoided in face and head cases because of the conspicuousness of the bandage and increased likelihood of superficial infection.

Strands of silkworm gut are usually placed in contused or lacerated wounds, to establish drainage. In larger wounds with macerated soft parts and much dirt included, it is recommended that the edges be trimmed and the fresh, raw surfaces thus formed be coapted by suture and drained for a few days.

An interesting report of cases is included, indicating satisfactory results from its use, and pointing to the economy of its use and its painlessness.

V. E. DUDMAN.

Potherat, G.: Primary and Secondary Union of War Wounds (*Réunions primitives et réunions secondaires des plaies de guerre*). *Bull. et mém. Soc. de chir. de Par., 1917, xliii, 2225.*

In 221 primary sutures of wounds Potherat had 2 failures and 11 partial failures. When for instance the wound was more than twelve hours old or was a long sinuous seton, and he could not obtain primary union, he did secondary suture. After the usual surgical disinfection, he submitted the wound to continuous or intermittent irrigation with chloride of magnesium, 12.5 per 1,000, to which is added 0.125 gr. of ammonium chloride.

Potherat has used the Carrel-Dakin solution, but

has not found the method satisfactory. Wounds are not cleansed as rapidly as claimed, and often there are peripheral burns observed on his own as well as on the patients of others. He prefers therefore to use magnesium chloride which is rapid in its action and is not harmful to the tissues; it is also easily prepared.

In from eight to ten days an arrest of suppuration is obtained and within a few days secondary suture can be undertaken. The results of 459 secondary sutures gave only 20 failures. W. A. BRENNAN.

Le Grand: Color Fixation of Tissues and Primary Suture (*Fixateur colorant et suture primitives*). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 2100.

Some time ago Le Grand reported his initial work in the coloration of contused wound tissue by a solution of methylene blue in formol as a guide for resection to be followed by primary suture. The present report gives further experimental and statistical results.

He has altered his solution. Instead of using a 40 per cent commercial solution of formol, he uses now a 20 per cent solution. The quantity of blue has also been reduced from 10 per cent to 5 per cent. With the revised method the effects previously observed on the blood-vessels or nerves, although lessened, still exist to some extent.

Success in wound treatment necessitates the removal of all tissue destined to necrosis. No antiseptic treatment will permit the primary suture of a wound, but resection of the contused tissues permits it. The color fixation of contused tissues has for its object the careful and exact resection of all contused tissue, and experimental research has shown it capable of effecting this. The technique of injecting the tissues is given.

The present statistics of Le Grand comprise 179 cases, with 10 failures. Of the 179 cases, 112 were wounds of the soft parts, 67 were osteo-articular, these latter giving 7 failures; 49 cases were fractures proper.

If articular fractures be excluded, all other fracture cases treated gave 85.7 per cent of success. In fracture of the long bones, including articular fractures, the percentage of success was 84.4 per cent.

The color fixation acts in two ways. It not only indicates what tissues ought to be removed, but it reveals diverticula which otherwise might escape the surgeon, and hinders the spreading of infection. It extends the period during which primary suture may be attempted. In the statistics are included 4 fracture cases operated upon and sutured more than twenty-four hours after occurrence.

W. A. BRENNAN.

ANÆSTHETICS

Clarke, T.: Anæsthetics in Military Hospitals. *Brit. M. J.*, 1918, i, 79.

The patient is given as a preliminary morphine, gr. 1/4, and atropine, gr. 1/50, half an hour before

operation. The anæsthetic generally used is ether preceded by chloroform, a separate mask being used for each. A layer of lint covers the mask for chloroform and two layers of lint for the ether mask, thus avoiding the danger of giving a mixture of unknown strength.

Invariably the open ether drop method on a Schimmelbusch mask is used. The average quantity of anæsthetic for an operation of half an hour is 2 drachms of chloroform, and 3 ounces of ether. Clarke has administered nearly 3,000 anæsthetics without one fatal case or any serious difficulty.

He has introduced the Shipway warm ether apparatus and finds it very useful in cases requiring prolonged administration. The type of patient is different from that in a general hospital in peace time. Most of the patients are robust young men living an out-of-door life. Those with shell shock require much more anæsthetic and have a greater tendency to excitement while going under its influence. CARL R. STEINKE.

Silk, J. F. W.: The Administration of Anæsthetics in Home Military Hospitals. *Proc. Roy. Soc. Med.*, 1917, xi, Sect. Anæsth., 1.

Silk states that the war introduces features in anæsthesia which are relatively unfamiliar in civilian practice. With the acute shock of the battle field the home hospitals have little to do, but on the other hand many men suffer from a condition of chronic shock which renders them troublesome from the anæsthetist's point of view. Many soldiers have been subjected to a prolonged suppuration, which has a bad effect upon the heart muscle. Also the dilated heart of overtraining and underfeeding is fairly frequent and when such a case comes to the anæsthetist, trouble is likely to occur.

In military surgery the exceptional cases call insistently for variations in methods of anæsthetization. But the normal or straightforward case is relatively more frequent. Accordingly the first consideration is the selection of a routine anæsthetic and method.

The difficulty of supplying the great number of war hospitals with skilled or even efficient anæsthetists is very great. This, together with frequent and necessary changes in the anæsthetists, renders it desirable to supply a standardized equipment, as simple as is compatible with efficiency. The present outfit is: (1) nitrous oxide apparatus; (2) Schimmelbusch's frame; (3) Clover's inhaler; (4) Junker's bottle (Rigby's safety pattern); (5) tongue forceps; (6) mouth gag.

The use of unmodified chloroform should be avoided, first, because even in the hands of the most skillful, the mortality is relatively high, approaching one to two thousand. Of the deaths reported to the author since January, 1917, 55 per cent or more were due to or occurred under undiluted chloroform. Of these fully 28 per cent died before operation had begun. Secondly, because the author has observed that among the earn-

est advocates of pure chloroform, few know how to give the drug properly. However, the value of this drug in certain cases must be recognized, and when sufficiently diluted with ether in one or another of the well-known mixtures, it forms a simple and admirable method of inducing anaesthesia previous to the continuous use of ether.

Nitrous oxide is not used as often as the author would like to see it, first, because the supply is scanty and irregular, and second, because the average anaesthetist in military hospitals fights shy of it. The anaesthetic of choice for continuous work is ether, and with certain reservations and precautions the author's preference is the open method, following these details:

1. An injection of morphia, 1:4 gr., and atropine, 1:100 gr., less than half an hour before operation.
2. A small piece of Gamgee tissue with a hole in it around the nose and mouth.
3. Schimmelbusch's mask, covered with 12 to 20 layers of gauze.
4. In most cases it is better to partially induce the anaesthesia with a mixture, or a Clover's inhaler; in many cases the author employs ethyl chloride on the open mask.
5. The metal drop flask of McCardie is recommended.
6. The use of Hewitt's open air-way tube, or a smaller or softer tube passed about five inches down the nose, which the author now employs in almost every case.

In cases of chronic shock, morphia may advantageously be used up to the limit of dosage, but in cases of sepsis, malaria, or other heart trouble, morphia should be avoided. In these cases one should avoid all but the most diluted doses of chloroform. As little anaesthetic as possible should be given. Anything like asphyxia should be avoided by diluting the vapor very freely. For this purpose oxygen given by itself or bubbled through the anaesthetic is very useful.

In intracranial cases, morphia is usually unnecessary, as the patient is often in a semi-comatose or dazed condition. For this reason, also, very little anaesthetic is required. The author prefers chloroform, it being desirable to limit the venous congestion so far as possible. He administers it by passing a small stream of oxygen through a Junker's bottle, leading the mixture down the nose, through a soft tube.

The mortality arising from operations of the empyema type is rather heavy. The chronic types seen in the home hospitals are particularly bad subjects for anaesthetics, and without doubt they ought all to have some form of artificial respiration, such as the intratracheal method. These cases should be concentrated in a few of the better equipped hospitals where this method is available. Failing this, chloroform and oxygen should be given gently through a Junker bottle.

In cases of spinal injury, where the patient

frequently lies face downward and avoidance of venous congestion is desirable, oxygen and a mixture from a Junker's bottle is advisable.

Orthopedic surgery might be expected to be a special field for the use of intraspinal methods, but this, surprisingly enough, is not the case. Nitrous oxide requires skill to hit upon the precise moment at which the fullest possible degree of relaxation is obtainable. The average cases do well enough with ether, but it must be given without a trace of asphyxia so that there is as little congestion of the veins as possible.

In plastic surgery troubles arise from the presence of blood in the mouth and pharynx, from the necessity of getting out of the way of the operator, and from the difficulty in manipulating the anaesthetic when the jaw is wholly or partly fixed, or is unduly mobile. There is no other operation in which the anaesthetist can be of so much real assistance to the surgeon. In most cases exceptional methods will have to be employed, such as: (1) the intratracheal method; (2) the intubation method of Kuehn; (3) the oil-rectal method of Gwathmey; (4) anaesthesia induced with the patient sitting bolt upright, by means of a nose-tube conveying oxygen and the anaesthetic. Either plan may be supplemented by the use of suction apparatus in the mouth.

ALBERT EHRENFRIED.

Phillips, H. R.: Apparatus for Administering Oxygen with Ether and Chloroform. *Proc. Roy. Soc. Med.*, 1917, xi, Sect. Anæsth., 13.

Phillips describes an apparatus for administering oxygen in combination with ether, chloroform, or both. An oxygen cylinder is connected with a three-bottle apparatus. Valves control the passage of oxygen through the bottles, which contain respectively chloroform, ether, and water.

Experience with the use of this method in nearly 1,000 cases gives evidence of (1) simplicity, (2) economy, (3) absence of cyanosis, and (4) infrequency of postanæsthetic vomiting.

ALBERT EHRENFRIED.

Scott, A. C.: Local Anaesthesia in Major Surgical Operations. *Texas St. J. Med.*, 1917, xiii, 269.

It is not necessary to apply the anaesthetizing agent directly to the tissues to be cut. It may be applied entirely outside the line of incision in such a manner as to secure good anaesthesia and maintain it until after the completion of the operation. This is accomplished in two ways: (1) by thorough infiltration of the skin and subcutaneous tissues on the proximal side of the proposed line of the incision near, but not necessarily within, such a line; or (2) by infiltration of skin and subcutaneous tissues in two lines an inch or more apart between which the incision is made.

To help maintain the anaesthesia adrenalin is used in the solution, with the advantage of reducing local bleeding during the operation.

After the skin and subcutaneous tissues have been incised down to the muscular tissues beneath, the operator should anesthetize the deep fascia or aponeurosis, giving special attention to the nerve-trunks on the side of the wound from which they come, when possible to locate them. The abdominal fascia or muscular sheaths having been infiltrated and incised, the operator is soon down to the sub-peritoneal tissue. This is the most sensitive tissue to be dealt with and is not easily anesthetized if the operator is careless, unskillful or hasty.

The peritoneum is anesthetized by pressing the point of the needle well into the transversalis fascia, or posterior sheath of the rectus, near the center of the wound.

When the abdominal wall is properly anesthetized and a sufficiently large wound made to work without strong or rough traction, almost any kind of operation may be satisfactorily done within the abdominal cavity if it does not require much traction upon the mesentery or the separation of firm adhesions.

The preferred solution for local anesthesia in the Temple Clinic is one-seventh of one per cent solution of novocaine, containing about three minims of adrenalin solution to the ounce, which is added at the time of operation. For this purpose sterile adrenalin solution is kept in 1 ccm. amber glass ampules.

EDWARD L. CORNELL.

Sollmann, T.: The Comparative Efficiency of Local Anesthetics. *J. Am. M. Ass.*, 1918, lxx, 218.

Sollmann has conducted a number of experiments to ascertain the comparative efficiency of local anesthetics. He divided his work as follows:

1. Intracutaneous method; i.e., infiltration and injection anesthesia, using cocaine, novocaine, tropococaine, alypin hydrochloride, beta-eucaine hydrochloride, quinine-urea hydrochloride, apothesis, antipyrine, and potassium sulphate.

2. Sensory fibers of nerve-trunks, using cocaine, novocaine and tropococaine hydrochloride, alypin hydrochloride, potassium chloride, quinine-urea hydrochloride, and antipyrine.

3. Motor fibers of nerve-trunks, using cocaine, novocaine and tropococaine hydrochloride, alypin hydrochloride, potassium chloride, quinine-urea hydrochloride, and antipyrine.

He summarizes his investigations as follows:

1. For the anesthesia of mucous membranes, cocaine, beta-eucaine, alypin and tropococaine are the most useful. Quinine-urea hydrochloride is fairly active. Apothesis, novocaine and potassium chloride are relatively inefficient. Alkalinization increases the efficiency from two to four times. The solutions of the anesthetic salts may therefore be mixed with an equal volume of 0.5 per cent sodium bicarbonate without loss of efficiency, and with a saving of one-half of the anesthetic. The mixtures, however, do not keep well and should be recently made. The addition of epinephrin does not increase the efficiency and is probably useless.

2. For infiltration and injection anesthesia, cocaine, novocaine, tropococaine and alypin are about equally efficient. Beta-eucaine and quinine-urea hydrochloride are intermediate; apothesis and potassium sulphate or chloride are relatively inefficient. The efficiency is not increased by alkalinization. Epinephrin greatly prolongs the action, and should always be added, except to tropococaine. The anesthetic action of potassium sulphate or chloride is not great enough to be of real value. A one per cent solution would be equivalent to about 0.125 per cent of cocaine or novocaine. However, it may well be used in place of sodium chloride for making anesthetic solutions, as suggested by Braun.

Several of the synthetic anesthetics can completely take the place of cocaine. In view of this fact, it would be feasible to prohibit entirely the importation, manufacture, sale and use of the habit-forming cocaine, except for scientific purposes.

G. W. HOCHREIN.

SURGICAL INSTRUMENTS AND APPARATUS

Adams, J. E.: A Simple Method of Mechanical Fixation for Fracture of Long Bones. *Brit. M. J.*, 1918, i, 12.

In the case of broken bones it is most desirable to have a method of fixation applicable to compound as well as simple fractures. Bone grafting in the presence of sepsis is always doomed to failure. The author calls attention to some of the disadvantages of plates, metal screws, etc.

The bone clip which the author describes is designed to partially encircle the fragments and press them together, favoring rapid healing. It is made of tempered spring steel and exercises continuous elastic pressure on the fragments of bone within its grasp. Not more than two-thirds of the circumference of the bone should be grasped by the clip. The strength of the spring is sufficient to counteract laterally acting forces tending to displace the fragments, and the teeth by which the bone is gripped will resist a force acting in its long axis. All that is necessary after the clip is in position is immobilization by splint to avoid violent movement and no extension need be applied to the limb. A transverse fracture can be quite well secured by a single clip or by one which is made especially wide.

A linear incision is made down to the seat of the injury, the long fragments are identified, and the way in which they require to be fitted so as to obtain perfect apposition is noted. In oblique fractures forcible extension with rotation of one or the other fragment is usually satisfactory, but with jagged and irregular bone surfaces, protrusion of the ends through the wound and then dovetailing them into position by manipulation is the better plan. After the bone ends have been gotten into perfect apposition, the open clip by means of a special instrument or introducer is passed around the bone at the seat of fracture and adjusted until it holds the fragments

in a firm grip. The spikes or teeth in the clip obviate the need for screws or nails and they allow a small space between the metal and osseous tissue, so that pressure necrosis is hardly to be feared and there is no tendency for the clip to become buried in the bone.

The author has recently operated upon six cases of simple fracture of the femur, with a perfect result functionally and anatomically and no shortening except in one case. In the exceptional case supuration occurred and union was delayed; however, satisfactory alignment of the femur has been maintained. The author feels that the use of the clip may be extended to compound fractures.

The clips fit best over round bones, but they have been of considerable service in such bones as the tibia. The clips are easily removed, should occasion arise later, by the introducer which is made in two pieces or by using the point of a Lane retractor as a lever to lift up the spring and dislodge it from the bone.

The author recently employed one of the flanged clips with good results in the case of a transverse fracture of the femur in a child, the flange being secured to the upper fragment with a clip having no teeth. He feels that these clips are worthy of trial

in cases of compound fracture due to gunshot wound, the cases being selected with due reference to the accessibility of the bone ends and the clips applied within a short time of the receipt of the wound. They are not open to the same objection as Lane's plates, in that they are not likely to carry infection before them and produce extensive osteitis. They hasten the repair of the fractured surfaces even in the presence of infection, and treatment of the wound by Carrel's or similar methods would in no way conflict with their efficiency as an internal splint.

Oblique fractures are most amenable to the clip method of fixation, but existence of comminution is probably no bar to success. When there is a considerable gap in the bone, some external extension apparatus is required to retain the normal length of the limb, and clips are not suitable.

The clips are made of spring steel and in sizes ranging from one-half to one and one-half inches in diameter. Those suitable for oblique fractures are provided with teeth turned over from the edge to grip to the cortex of the bone. It is desirable to use the smallest clip which will embrace the bone so as to secure the maximum degree of elastic pressure.

V. C. HUNT.

SURGERY OF THE HEAD AND NECK

HEAD

Salinari, S.: War Wounds of the Head (*La ferite d'arma da fuoco del capo*). *Riforma med.*, Napoli, 1917, xxxiii, 1053.

Salinari introduces his article by referring to the protection afforded by the new helmets against head wounds. Reverchon for example reported that in 1915 every third wound was a head one. Chevassu found that of 20 men with cranial injuries, 13 of which had carried the helmet and 7 had not, 5 of the wounds in the latter were fatal, while none of the helmet carriers died.

Salinari's statistics comprise 15,000 wounds, of which 1,827 were head wounds. Five per cent of the wounds were facial, and seven per cent, or 1,079 cranial. Of these 1,079 cranial wounds, 583 were soft part wounds; 325 involved the cranial bones, and 171 were meningeal and encephalic.

Of 748 facial wounds, 257 were of the soft parts.

Experience has taught the author to distrust wounds which apparently involve the soft parts alone, as he has seen many such with later severe cerebral developments. The slightest evidence of a fissure or depression in the bone should be sufficient indication to subject the patient to a thorough X-ray examination.

The author discusses the pathologic anatomy of cranial lesions, especially of those involving the meninges.

As regards symptoms, in a great many cases there is very little pain or general disturbance at first, and even in a few days after a trepanation, the recovery is rapid.

The favorable results which the author has observed to follow the immediate operative treatment of cranial wounds and the end-results lead him to acquiesce in Oehler's assertion that the triumph of war surgery is in the treatment of cranial wounds. Only two circumstances ought to deter one from intervention, namely, an insufficient surgical equipment, and the patient's condition, which would include traumatic shock.

The author deals in detail with the operative treatment of different types of lesions of the head. In cases where there were symptoms of irritation or of meningo-encephalic lesions but without clear evidence of a skull injury, a few days were allowed to elapse before operation. Observations were made on the spinal fluid and according to the findings and the general progress, a trepanation was done or not. Then if the dura was found intact, nothing beyond decompression and surgical clearance was done, the dura being left intact.

The general rule in other cases and with tangential wounds, no matter what the state of the bony lesion, was to open up the dura and relieve internal pressure.

In penetrating wounds with retained projectiles, the conduct followed depended on the case. The

most exact and painstaking localization possible of the projectile was made radiographically. The route of approach was then studied before attempting extraction, so as to spare the patient the disastrous effects of a more or less blind search for the projectile. Only when the projectile could be reached without undue manipulation was its extraction attempted. Where there was no interference, toilet of the wounds by means of drainage was done; no attempts were made to cause the projectile to migrate toward the point of entry. Bier's gravity suggestions result merely in increasing the local symptoms of suppuration, etc.

The author deals in detail with the technique of searching for and the best method of extracting bone fragments from the cranial cavities.

The internal wound is drained but is never systematically sutured owing to the fear of later infective complications. Many patients, in fact, who seemed out of all danger developed classic meningitic or excephalitic symptoms and succumbed in varying periods of time.

Generally paralytic motor symptoms disappear after operation, even when the lesions are very extensive. But in some regions they persist, as well as certain sensory paralyses. Paretic phenomena generally disappear within twenty-four hours.

Cerebral hernia has always been the sign of a deep-seated infection. Hernia of itself is not an absolute indication for intervention. The author uses compression only, according to the method of Delagenière, by suturing strips of the neighboring skin loosely over a disc of gauze placed on the herniating part. With patience this succeeds in reducing the hernia, by keeping the patient's head high. A lumbar puncture is made if there is much headache. The stitches can be removed and the disc renewed after eight or ten days.

The author has never seen a cranial hernial tumor spontaneously disappear. In cases where reduction is not obtained under treatment, the prolapsed mass tending to become softer and purplish in color, the author uses the thermocautery to remove it.

The final part of the author's article deals with a consideration of plastics for repair of losses in cranial substances.

Owing to the ultimate complications which may arise, as well as the difficulties in following the course of his operated patients through the various hospitals, the author thinks it useless to give any conclusive statistics with regard to results.

W. A. BRENNAN.

Sieber, P. R.: Pulse-Rate and Blood-Pressure Observations as an Aid in the Treatment of Head Trauma. *Ann. Surg.*, Phila., 1918, LVII, 51.

The author, as a result of his observations in a series of 76 cases of fracture of the skull resulting from acute head injury, lays great emphasis upon the pulse-rate and arterial pressure, these symptoms being used to determine the degree of encroachment

on the vital centers and the necessity for operative interference.

Cushing in experiments upon dogs has shown that by increasing the intracranial pressure equal to that of the arterial pressure the resulting anemia stimulates the vagus center, thereby slowing the pulse. At the same time the vasomotor center is stimulated, causing a rise in arterial pressure sufficient to again restore circulation to the brain. By gradually increasing the intracranial pressure the physiological response will cause a rise of arterial pressure to a point two or three times that of the normal pressure.

Fractures of the skull are often accompanied by an increase in intracranial pressure and furthermore this tension frequently rises to such a height that the cerebral vessels are compressed with the resulting anemia and death. In many instances there has been a striking similarity in the symptoms preceding death in cases of fracture and those produced in animals by increasing the intracranial pressure. Observations have shown that with the increase in stupor there is a gradual increase in the blood-pressure and decrease in the pulse-rate. In the final stages there is a stertorous, or perhaps a Cheyne-Stokes breathing, the temperature rises, the reflexes disappear and the patient becomes relaxed. The blood-pressure gradually falls to zero and the respirations cease. The vasomotor mechanism has been unable to maintain the blood-pressure above the intracranial tension and supply sufficient blood to the respiratory center.

The author divides these cases of head trauma into three groups:

1. Those which at no time show any evidence of intracranial pressure. In these cases surgical interference is not indicated unless fragments of bone are depressed.

2. Those cases showing signs of a definite increase in intracranial pressure. In these the observations of the blood-pressure and pulse-rate are most useful in determining the degree of intracranial pressure and as an indication as to whether operative interference is necessary. In nineteen of the author's cases operation was deemed necessary and of these ten made a good recovery. Two of the deaths were due to pneumonia and one to meningitis.

3. Cases presenting signs of advanced medullary compression or those in which there is evidence of severe laceration or contusion of the brain. Twenty-three of the author's cases were included in this group. In many of these the regulatory vasomotor mechanism has collapsed, while in others the rapidly decreasing arterial pressure and increased pulse-rate indicated that the vasomotor mechanism was making a feeble effort to supply the bulbar centers. Of these cases twenty resulted in death. Twelve were operated upon with three recoveries. The subtemporal decompression was the operation of choice in relieving pressure symptoms.

GATEWOOD.

Morestin, H.: Shell Wound of the Face; Repair

Operations (Plaie de la face; mutilation du nez; destruction des branches montantes des maxillaires supérieures; mutilation de la paupière inférieure droite; perte des deux yeux; opérations réparatrices. *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1397.

In the case reported by Morestin a piece of shell had torn away the right lower eyelid; the right eye had burst; the root of the nose was carried away; and the two ascending branches of the maxilla were smashed in bits, especially on the left side. There was a large suborbital orifice, and vision was completely lost.

The patient was under disinfection treatment from the end of June until September. Repair of his disfigurement was then begun by excision of a tumorous fragment of the lower palpebral conjunctiva on the left side. The palpebral edges were freshened and blepharorrhaphy done. The eye was definitely closed.

In October the bridge of the nose, which was embedded in the fossa, was freed, repaired, and sustained in its required position by supports passed through the nostrils.

Late in November the right eyelid was treated by strips of suborbital skin. Whatever was left of the edges was freshened and a blepharorrhaphy again done.

In December the sixth and seventh left costal cartilages were removed for use in reconstructing the nose and to fill the breach in the center of the face. After extensive skin elevation, a ring of cartilage was placed vertically under the skin of the forehead after making a transverse incision which was to serve as the axis of the strips for the reconstruction of the nose. This was placed slightly to the right of the median line. To the right and left other pieces of cartilage were installed to serve as supports to the nose and the lost parts of the upper maxillaries. The losses being asymmetrical, the flaps had to be planned accordingly.

To the right of the axial stem which had been sutured to the deep face of the skin two large pieces of cartilage were fixed and one to the left, to be trimmed later.

On February 1 the contour of the very extreme skin strip was traced and the incision sutured. The object was to obtain an autonomous strip and develop circulation from its pedicle. February 21 the strip was detached from its deep bed. On the following days it was gradually subjected to torsion a few degrees each day. The pedicle was to the left and at the level of the inner extremity of the eyebrow and the adjacent part of the orbit. The strip descended bit by bit in front of the right brow and orbit and finally before the nasal breach.

On March 24 the junction of the strip with the nasal ridge was made. April 1 it was united to the right edge of the breach; on April 16 the left side was united and the breach was entirely closed. In order to give definite form to the nose, different

retouchings were made between May and December. The results are very good. The reconstructed nose is quite solid. There is no looseness between the cartilage pieces transplanted and the bones to which they are united. The skin which covers the root and bridge of the nose and part of the suborbital region has united without inequalities or depressions. The nares are free, and largely permeable to respiration. In short, the patient has neither inconvenience nor pain. There are seven illustrative photographs.

W. A. BRENNAN.

Aymard, J. L.: Nasal Reconstruction; with a Note on Nature's Plastic Surgery. *Lancet*, Lond., 1917, cxliii, 888.

While methods for reproducing the complete nose have in the past been discussed in textbooks, the causes for failure are seldom dealt with, and details of the work are deficient.

Almost the greatest difficulty presenting itself is the fact that where the nose has been destroyed by war injury, the scar tissue surrounding the lost organ has to be utilized for the junction of the new flap. The most common cause of failure is probably due to the fact that the nasal cavity is not an ideal aseptic one at any time, but is rendered much more unhealthy by damage to one or more sinuses and their surrounding tissues. No plastic operation of any kind can possibly suffer by reasonable delay.

The flap should be taken, if possible, from the site likely to lead to the least ultimate disfigurement. The lining of the flap should take some form other than scar tissue. The new organ should, as much as possible, correspond with the original. The supporting framework should simulate the original. The bed area for the new organ should be most carefully prepared. The author has used a new flap method, taking a long pedicle flap with its base near one clavicle and forming the nose upon the chest on the opposite side, keeping the head slightly bent upon the chest for fourteen days. If this chest flap fails, he uses two flaps, one from the forehead and an alar flap from the cheek.

The necessity for some form of covering other than scar tissue internal to the nasal cavity is generally admitted, and the author has endeavored to overcome this difficulty by removing the entire periosteum. In attempting to obtain resemblance to the former organ, it is a distinct advantage to have a skillful sculptor.

The author is in favor of an all-cartilage framework. Cartilage will attach itself to bone exactly as will bone to bone, and the resistance of cartilage to mild sepsis is an argument in its favor; also, cartilage remains constant where bone, unattached, is prone to disappear.

In the preparation of the skin area upon which the new nose is to be embedded, it is advisable to undercut the skin and tissues in order to contract the opening and bring healthy new tissues into the region for this purpose.

In the preliminary treatment it is essential to

get the patient in as good general health as possible. The establishment of the nasal passages must be well carried out. Common sources of trouble are suppurating lachrymal sacs, antra, sequestra, portions of nasal bones embedded in the cheeks, and the condition of the patient's teeth.

Removal of the cartilage to be used as the supporting framework should be done first, usually from the costal cartilages, and the wound closed before any further work is done to prevent infection.

As a dressing the author uses ambrine wax with an addition of 50 per cent paraffin, and sometimes a light gauze dressing. Massage is of the greatest value later in straightening the nose and in improving the condition of the skin. V. C. HUST.

Pont: Rhinoplasty and Nasal Prosthetics (Rhinoplastie et prothèse nasale). *Lyon méd.*, 1917, CXXXI, 208.

Pont thinks that restoration of the nose by rhinoplasty is always preferable to prosthetics. Prostheses should only be employed (1) when rhinoplasty is impossible or contra-indicated; (2) when rhinoplasty will not give satisfactory æsthetic results; (3) as a temporary expedient before or during the different phases of surgical intervention.

At present rhinoplasty with cartilage grafts is the method of choice. Tuberculous, syphilitic or cancerous lesions generally exclude rhinoplasty; similarly in extensive facial burns the bad condition of the tissues would not give sufficient nourishment to repair strips. The principal indication for rhinoplasty is therefore found in pure traumatism with extensive loss of substance.

Some cases of rhinoplasty executed at the maxillofacial Surgical Center of Lyons are detailed and illustrated.

The prosthetic methods used by Pont have previously been described. An apparatus is furnished to the patient which enables him to make a new artificial nose of plastic paste as often as necessary. This gives an æsthetic prosthesis. But Pont has found that patients neglect this because it is troublesome, and that the desired end is not accomplished. He therefore now gives in addition a new apparatus for wax models which can easily be made and may be changed each day and put on as easily as a pair of spectacles. This he calls a work-day apparatus which fulfils its purpose satisfactorily.

W. A. BRENNAN.

Cole, P. P.: The Treatment of Wounds Involving the Mucous Membrane of the Mouth and Nose. *Lancet*, Lond., 1918, CCIV, 11.

The following is the author's summary as to the manner of obtaining the best surgical and cosmetic effects under such circumstances.

1. The result in any given case is largely influenced by the initial treatment adopted.

2. The whole plan of treatment should be the joint evolution of surgeon and dentist working in concert to attain a common aim.

3. Open-bite splints should invariably be used in the type of case considered.

4. The method known as "bringing the parts together" should be recognized frankly as unsatisfactory and should be abandoned.

5. Skin is an admirable substitute for mucous membrane in that its texture is suitable and its extent unlimited.

6. Radiations may render the plastic surgeon such valuable assistance that facilities for treatment by this method should be provided in hospitals or centers for the treatment of jaw injuries.

C. B. HOLLINGS.

Morestin, H.: Cartilage Grafts in the Repair of Extensive Losses of the Jaw (Pertes de substance très étendues de la mâchoire inférieure; transplantations de cartilage). *Bull. et mém. Soc. de chir. de Par.*, 1917, XLIII, 1712.

Morestin reported 5 cases of extensive war injuries of the lower jaw in which he had made plastic operations using cartilage grafts. The æsthetic result is remarkable and Morestin claims that the functional benefit is incontestable.

Sebileau criticized the value of repair operations of the lower jaw with cartilage. Laying aside the æsthetic results he says that a fracture of the lower jaw can recover by pseudarthrosis and without the fragments placing themselves in such position that defective dental articulation results.

As regards the value of the consolidation obtained by Morestin with cartilage grafts, this can be judged from the anatomic and functional standpoints. From an examination of the patients exhibited he finds that the fragments are not consolidated either anatomically or physiologically, neither subjectively nor objectively. The question is important because it concerns the future of an operation destined for the betterment of the wounded. The value of a surgical therapeutics is scientifically based on the results that it gives to each patient to whom it is applied.

W. A. BRENNAN.

Chatelin, C. H., and DeMartel, T.: Wounds of the Skull and Brain. Paris: Masson & Cie., 1917.

In a preface to this work, Marie sums up well the chief differences between cerebral pathology under ordinary conditions and that following war wounds in the following words: "Cerebral pathology, as we knew it, was almost exclusively a pathology of the white matter. War wounds have shown us quite different conditions, viz., lesions of the cortex, to the more or less complete exclusion of the white matter. And so this new pathology resembles infinitely more nearly the conditions of experimental physiology than did the former cerebral pathology. The latter, which could be termed cerebral leucopathology, showed us above all massive syndromes, i.e., hemiplegia, persistent aphasia, hemianopsia, etc., while the new cerebral poliopathology affords a consideration of cellular

symptoms, monoplegias, dissociations at times very delicate."

Chatelin presents solely a study of cases of head injury which have recovered from the primary effects of the wound, and which can be subjected to a minute neurological examination. It is limited to the late results, i.e., to those which persist several weeks after receipt of the wound and in which a careful clinical study can be carried out.

In the examination of the patient, great stress is placed on a careful interrogation of the wounded man as to the exact circumstances under which he received his injury and the first symptoms noted, subsequent events following the injury, surgical operations undergone, and present symptoms.

The actual condition of the wound is to be carefully noted, especially as to the cutaneous scar, healing, loss of bony substance, and depth of involvement.

Cranio-cerebral topography is next discussed in its relation to localization of cranio-cerebral injuries, followed by neurological examination of the patient in regard to motion, reflexes, sensation, co-ordination, equilibrium, gait, speech and special senses. The examination is completed by lumbar puncture and radiography.

The subjective symptoms common to all wounds of the skull are presented.

A detailed discussion of wounds of the various regions of the brain, with short discussions of meningitis, abscess, epilepsy, and foreign bodies is given.

DeMartel's discussion of wounds of the skull, though shorter, should be of more particular interest to the surgeon. The following is a summary of the more important points brought out:

The importance of protective measures, directed to minimize the gravity of wounds of the skull, such as wearing of the steel helmet, keeping the hair cut short, and scrupulous cleansing of the scalp after receipt of the wound, is pointed out.

It is important that hospitalization of the wounded man should be in a place where he can be operated upon and followed by the same surgeon for several weeks. There is generally no urgency about operating on cranial wounds, as is the case with wounds of the digestive tract or circulatory system. If the abdomen, like the skull, contained only solid organs, instead of hollow viscera filled with septic matter, the same would apply to it. On the contrary, there is a distinct advantage in postponing operation on skull wounds for a few days, in order to allow protective adhesions to form and thus limit the field of infection. Wounds of the brain gain everything by being evacuated at once to a hospital where they can remain for several months, if necessary, under the observation of the same surgeon who has operated. Immediate operation on a penetrating wound of the skull, especially if carried out by the usual method of enlarging the orifice with rongeur forceps, can hardly fail to aggravate and disseminate the infection by breaking down the protective adhesions which limit the traumatized area.

For three years the author has performed all cerebral and cerebellar operations under local anaesthesia. The advantages of this over general anaesthesia lie in the fact that the patient can co-operate with the surgeon by modifying his position, by making at will movements of forced inspiration and expiration, the former diminishing venous haemorrhage and the latter separating the edges of the cerebral wound, and furthermore the shock and haemorrhage incident to a general anaesthesia are avoided. The anaesthetic solution consists of 0.5 per cent novocaine and 0.0005 per cent adrenalin in normal saline.

For the operation, if his condition permits, the patient is seated astride a chair, facing the back, with his arms supported on a special rest attached to the back of the chair, and his head resting on his arms.

Whenever possible, i.e., whenever the loss of substance of the skull is slight, as is most frequently the case, the author makes a quadrilateral osteo-cutaneous flap. After injection of the local anaesthetic, a silk basting suture is placed at the base of the proposed flap, in order to insure complete haemostasis. The author's special hand and power-driven instruments for cutting the bone are described, in addition to the technique to be employed when only simpler instruments are available.

The advantages of the temporary osteo-cutaneous flap over the usual method of trephining and enlarging the breach in the bone with the rongeur forceps are many. The temporary flap does not leave any trace, any deformity, always produces a cerebral decompression of benefit to the patient, is not the cause of cerebral hernia of mechanical origin, as so often follows the classical trephining operation. It gives a very broad view of the lesions, and can be reopened as often as necessity demands. Enlargement of the bony opening with the rongeur presents none of these advantages, but is absolutely indicated every time the bony destruction is considerable and does not allow of an osteo-cutaneous flap.

If at operation the dura is found to be intact, it should not be opened under any pretext. To open the dura in order to evacuate a haematoma or brain pulp resulting from a violent contusion, means almost certain infection of a field hitherto aseptic and invites meningitis and encephalitis. If the dura is perforated, if cerebral pulp escapes through the opening, if the still intact dura is black and immobile, if the existence of exudate or an area of softening is proved, it is quite logical, on the contrary, to enlarge the meningeal opening and to evacuate gently and as completely as possible the already infected region. The dura must then be sutured with care except at the place where it was torn. At this point a cigarette drain is placed. Rubber tubes are never used for drainage. In order to empty completely collections of blood, softened cerebral substance and splinters, without injuring the normal tissue forming the walls of the cavity,

it is best to pass the finger gently in all directions, under a continuous current of warm saline solution. Foreign bodies of steel are removed by means of an electromagnet constructed on the principles of the Hirtz compass used in localization.

It is necessary to observe caution in the use of lumbar puncture in the early days of a wound of the skull, because of the danger of diminishing the volume of the brain which thus detaches itself from the membrane to which it was adherent. The meningeal space, hitherto potential, thereby becomes real and exposes itself greatly to infection. Later, however, lumbar puncture may render great service in lowering intracranial pressure and may be repeated frequently with benefit, particularly in cases in process of recovery who complain of headache and vertigo.

R. H. IYV.

Velter, E.: Haemostasis by Muscle Strip in Cranial Surgery. (Sur l'hémostase par lambeau de muscle en chirurgie crânienne). *Presse méd.*, Par., 1918, p. 31.

Velter calls attention to the great importance and difficulty of obtaining good haemostasis in cranial and cerebral surgery. The method inaugurated by British surgeons especially, such as Horsley, Sargent and Holmes, by the application of muscle strips in order to obtain haemostasis of the bone and venous sinuses he considers most effective and satisfactory, and regrets that it has not had wider acceptance and application by surgeons at the present time.

The technique is simple. A piece of any muscle sufficient for the purpose is cut. After rapid removal of clots with a tampon, the piece of muscle is placed on the bleeding point and pressed down firmly with the finger or any soft instrument. It adheres in a minute or so and stops the haemorrhage completely. It is applicable only to haemorrhages from the bone or from the venous sinuses.

Velter has tried this method in a number of cases and has found it a rapid and effective method.

W. A. BRENNAN.

Rouhier, G.: Cartilage Grafts and Loss of Cranial Substance (Pertes de substance crânienne et greffes cartilagineuses). *Presse méd.*, Par., 1917, p. 722.

Rouhier has repaired 34 cases of loss of cranial substance by cartilage grafts according to the method devised by Morestin, with slight modifications. He has never had any sloughing of the graft and the results as long as they could be observed have been quite satisfactory.

Complete cicatrization of the wound is awaited. Three months at least ought to be allowed for this. Then the skin is incised around the scar and pediculated skin strips dissected out. The fibrous scar is dissected and the bony edges of the orifice trimmed. A piece of costal cartilage is removed from the patient and trimmed to shape. This is done during the cranial operation, the cartilage being

immediately placed in a compress soaked in warm salt solution. It is at once placed in position, the most rigorous aseptic precautions being observed. The perichondrial face of the graft is turned toward the brain. The edges which have been shaved down are inserted under the pericranial periosteum. A notch cut on the outside surface of the graft allows it to be easily adapted to the required curvature. The cutaneous strips are then turned and sutured over the graft.

The author says that there is little fear of any ulterior endocranial proliferation of the graft; a reduction in its size is more likely. It becomes fixed at about the end of three weeks, but it is well to keep the patient under observation for six weeks. The patient gets the impression of solidity, and there is no fluctuation at the site of the graft even during severe coughing.

The author cannot give a definite opinion as to the final outcome of such grafts, as his cases are only about ten months old at most. More than one piece of cartilage may be used in repairing a defect.

W. A. BRENNAN.

Villandre: Cicatrization of Cranial Wounds from the Surgical Viewpoint (Cicatrisation des plaies du crâne au point de vue chirurgical). *Arch. de méd. et pharm. mil.*, Par., 1917, lxxviii.

Villandre thinks that cicatrization of a cranial wound is not always an indication of recovery. It must be borne in mind that cranial traumatism leaves definite lesions which may progress either (1) by the organization of intradural or intracerebral blood clots; (2) by cystic transformation of losses of encephalic substance, either effected mechanically or by necrosis of cerebral hernia or by more or less localized encephalitis; (3) by latent infection in the vicinity of foreign bodies, bone, fragments or projectiles, or even in the thickness of the cicatrix. Such a latent infection may be suddenly awakened and cause late complications; (4) finally, when a cranial wound shows slow cicatrization with a fistula alternately dry and suppurating, this condition may precede encephalitis.

Of 450 cranial wounds examined in the author's service, secondary intervention owing to the development of infection was necessitated in 47 cases with a cranial fistula and 14 with encephalic abscesses. In 23 of these a projectile or some other fragment was extracted. If to these be added the secondary operations for epileptic attacks without cerebral infection, there is a total of 303 secondary operations in 450 cases of cranial wounds.

The different findings show that:

1. In the immediate treatment of cranial wounds, mechanical disinfection of the wound and extraction of foreign bodies must be practiced as early and as completely as possible.

2. In the treatment of secondary complications, whether infective or not, a continuation of the treatment must be assured in special surgical units. This will obviate many errors both in the treatment

itself, as well as in the disposal of the wounded. There should be proper co-operation between the first aid station and the territorial hospital where such cases of head injuries are sent.

W. A. BRENNAN.

Dandy, W. E., and Blackfan, K. D.: Internal Hydrocephalus. *Am. J. Dis. Child.*, 1917, xiv, 424.

Twenty-six cases of internal hydrocephalus have been studied, 15 of the obstructive and 11 of the communicating variety. These cases have been studied with intraventricular and intraspinal injections of phenolsulphonephthalein.

Postmortem examinations have demonstrated an obstruction in every case in which an obstruction has been shown clinically by this test. The obstruction may be a congenital malformation or an inflammatory process or tumor, and may occur at any part of the ventricular system, but usually at the aqueduct of Sylvius or the foramina of Luschka and Magendie.

In all cases of obstructive hydrocephalus there is practically no absorption from the ventricles and frequently a normal absorption from the subarachnoid space. Hydrocephalus results because the fluid is mechanically prevented from passing from the ventricles, where the fluid forms, to the subarachnoid space, where it is normally absorbed and where only it can be absorbed.

Communicating hydrocephalus is caused by a barrier of adhesions at the base of the brain which mechanically prevents the cerebrospinal fluid from reaching the cerebral subarachnoid space where the greatest part of absorption normally takes place. The various cisternæ or centers for the distribution of cerebrospinal fluid are more or less obliterated by adhesions.

Absorption of cerebrospinal fluid is a general process from the entire subarachnoid space, and communicating hydrocephalus results because only a fraction of this area can be utilized for absorption.

These pathologic findings harmonize with the clinical phenolsulphonephthalein tests, which show a greatly diminished absorption from the subarachnoid space.

Obstructive and communicating hydrocephalus is, therefore, essentially the same, and, in reality, each is due to obstruction. In the obstructive variety the obstruction is in the ventricular system; in the communicating variety the obstruction is in the subarachnoid space.

Obstructive hydrocephalus may, by operation or spontaneously, change to communicating hydrocephalus, or the reverse may occur spontaneously. Careful studies with the phenolsulphonephthalein test will indicate these possibilities.

Meningitis is by far the greatest etiologic factor in both types of hydrocephalus and probably always causes the communicating variety. This may be either prenatal or postnatal. The meningitis may be of a very mild grade and easily overlooked.

There is a definite relationship between a menin-

gocele and internal hydrocephalus; both usually result from the same cause. The removal of a meningocele may aggravate a fairly well-balanced or even arrested case of internal hydrocephalus. This probably results from a diminution of the absorbing area.

Spontaneous recovery of internal hydrocephalus sometimes occurs. The surgical treatment of internal hydrocephalus has now a definite anatomic basis and hopeful prospects. The operative results of a series of cases will appear in a subsequent communication.

EDWARD L. CORNELL.

Gross, G., and Houdard, L.: Primary Suture of Craniocerebral Gunshot Wounds (La suture primitive des plaies cranio-cérébrales par projectile de guerre). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 2188.

The Interallied Surgical Conference last May concluded that in favorable cases where the dura was intact, reunion could be made by first intent; and if the dura mater and brain were involved the craniocerebral wound could be treated by primary or secondary suture after sterilization. The authors think that primary suture of such wounds should always be practiced. Their practice is in all cases where the dura is intact to suture at once. When the dura is injured, and there is no projectile, after clearing and cleansing the area they suture, if such is anatomically possible. Generally they find that the removal of cranial projectiles has more disadvantages than advantages. In case of very large projectiles operation is useless; the extraction of very small projectiles is more harmful than otherwise.

The authors have treated 42 very severe craniocerebral lesions by primary suture. These were discharged in from forty to sixty days, although there was more or less abundant loss of cerebral matter in these cases on their arrival in the author's ambulance service.

The total results of the sutured head injuries are tabulated by the authors. There were in all five failures in 279 wounds treated.

The table shows 114 lesions sutured in which the dura was intact. Of these there were 107 recoveries and 7 deaths. Four of these deaths were due to shock or other complications. Sixty-three cases of craniocerebral wounds were sutured, with 42 recoveries and 21 deaths. Ordinarily a large number of the craniocerebral wounds develop abscesses or encephalitic complications before the third week or by the end of the second month.

Suturing prevents such complications. Two-thirds of the authors' cases left the station cured in less than sixty days. The authors claim that primary suture guarantees against secondary infection, which is the direct cause of the late complications; for the same reasons the later developments of cranial wounds are much diminished.

The only contra-indications to immediate suture admitted by the authors are very extensive loss of

skin and cranium and the general state of the patient.

Since the authors adopted primary suture in the case of cranial wounds their operative mortality has fallen from 56 to 33.3 per cent.

W. A. BRENNAN.

Payr: Elderwood Drains for Cerebral Wounds.
Deutsche med. Wochenschr., 1917, xliii, No. 16.

Payr of Leipzig thinks that elderwood drains are admirably adapted for use in cerebral wounds, on account of their lightness, the character of their internal and external surfaces, their consistency and hygroscopic qualities.

Glass and metal tubes are too heavy and too rigid for such wounds; rubber drains slip out of position. Capillary wick drains soak up the secretions and the cerebral necrotic matter.

Payr says that elderwood drains are cheap and easily made in different sizes and shapes, and possess these advantages:

1. They have practically no weight.
2. The hollowed out center can be brought to any degree of smoothness desired and can be polished time after time and used again.
3. Tubes of any length, thickness, etc., can be made quickly.
4. The material is easily obtainable and costs almost nothing.
5. By boiling or sterilizing the tubes become very pliable and can be adapted to the shape of any wound fissure.
6. They are very hygroscopic and easily become adherent to the cerebral substance, so that they do not change position. By soaking in liquid paraffin or melted wax, they can be made impervious. These tubes unite in themselves the tubular and capillary principles of drainage.

When the wounds are large, several of these drains may be used. Their weight will be practically nothing on the cerebral matter. The author never observed necrosis from their use, as was observed when other tubes were used.

The author treated six cerebral abscesses of various localities and age with these drains, all of which recovered.

W. A. BRENNAN.

Osnato, M.: An Interesting Pontine Syndrome.
N. Y. M. J., 1917, (vi), 1026.

The case here reported is of a longshoreman who, prior to this condition, was perfectly well. He was suddenly stricken two years ago with paralysis in the right arm. He believed that there was also paralysis of the right face. There was no loss of consciousness, and he did not fall. Five or six weeks later he fell to the ground in an unconscious condition, and remained so for a few hours. When he regained consciousness, he found that his right leg was paralyzed. The paralysis of the leg was flaccid, while that of the arm was spastic.

He developed peculiar mental symptoms of distrust, suspicion, condemnation toward his asso-

ciates, and moodiness. There was no memory or intelligence defect, and no signs of apraxia, aphasia, alexia, agraphia, amnesia nor astereognosis. All cranial nerves except the seventh and eighth were functioning properly. The pupils reacted to light and accommodations. There was no nystagmus.

In the distribution of the facial nerve, it was found that the left eyebrow was on a lower level than the right. There was a distinct drawing of the angle of the mouth to the right. Taste reactions to bitter, sweet, sour, and salt were absent in the anterior two-thirds of the left side of the tongue. The cochlear pathway of the eighth nerve was considerably affected. Hearing on the left side was gone.

A reaction of degeneration was present in the muscles supplied by both branches of the facial, therefore the lesion here was undoubtedly nuclear or at the exit of the root fibers. The lateral fillet on the same side must also have been involved at or near its decussation. There was no Romberg sign.

The reflexes showed an increase in the right triceps, biceps, and patellar over the left side. The abdominal, epigastric and cremasteric reflexes on the right side were absent. The right ankle-jerk was more active than the left and there was a distinct Babinski reflex and clonus on the right side.

There was no deviation of the tongue or uvula. There was a distinct loss of power in the muscles in the left side of the face, the right arm, and the right leg, most marked in the latter. Sensation in the right arm and leg showed a marked diminution to touch discrimination and a diminution particularly of light touch as tested by cotton wool. There was a marked hyperæsthesia to pain and temperature in the right leg below the knee. Sensation in the face was perfectly normal on both sides. Position sense was normal and vibration also appeared to be normal. Pressure sense was diminished slightly in the right half of the body.

It was concluded that this case presented a pontine lesion occurring at the level of the nucleus of the seventh nerve and the decussation of the lateral fillet, involving the left side, also the median fillet to a slight extent, the spinothalamic tracts which at this level are very close to the median fillet, and involving finally the pyramidal tracts and the nuclei of the pons. It will be remembered that the nuclei of the pons give rise to those fibers of the middle peduncle of the cerebellum which go to the cerebellum of the same side, all connections of the cerebellum being uncrossed; this might account for the ataxia in the left or sound leg. Another possibility should be considered in this connection, for the ventro-spino-cerebellar tract is very close to the lateral fillet at this point and it is possible that the ataxia in the left leg can be explained by an involvement of this tract. Sections through the level of the seventh nerve nucleus often show this tract as it

goes upward and outward to reach the superior peduncle of the cerebellum. The lack of tone in the right leg may possibly be accounted for by the break in the efferent path from the pallium to the cerebellum which is crossed. The loss of taste in the left tongue is obviously explained by an injury to the *pars intermedia* of the seventh nerve. The root fibers of this portion of the seventh must be involved because the posterior third of the tongue retains the sensation of taste which is supplied by the nucleus of the fasciculus solitarius which contains the sensory portions of the ninth, tenth, and seventh nerve nuclei. At this level it would be impossible to reach this nucleus.

M. A. BERNSTEIN.

Bell, W. B.: Experimental Operations on the Pituitary. *Quart. J. Exp. Physiol.*, 1917, xi, 77.

The author carried out a series of operations in order to investigate (1) the general effects produced by pituitary lesions; (2) the effects of these lesions on the genitalia; (3) the effects produced by the pituitary lesions on the other organs of internal secretion.

Paulesco in 1908 evolved the operative procedure known as the bitemporal route which has materially simplified the technique and has led to more reliable results. The author's researches concern themselves in testing the correctness of previous experiments carried out by Paulesco and by Cushing, and in attempting to gain further information concerning the experimental pathology of the pituitary. Reliance as to the structural conditions present was placed only on the results of complete histological examinations, which included the examination of the pituitary tissues removed and the site of removal; also of the genitalia before and after operation and of the other endocrine organs after the production of the pituitary lesions.

The operative technique used by the author is described in detail. Twenty-seven female dogs were subjected to operation, two of which died as the result of the operative procedures, as distinct from the actual lesions produced on the pituitary. Ether was administered by the intratracheal method. Most of the animals used were from four to seven months old. Hemorrhage was a frequent annoying accompaniment of the operation, but in all except one case it was controlled without difficulty. In no case were there severe postoperative complications. The animals generally drank milk within a few hours of the operation and seemed little affected the next day. Sometimes there was an escape of cerebrospinal fluid from the wound.

The author found that polyuria and glycosuria are frequent phenomena which may follow injury or stimulation of any part of the pituitary. He was unable to verify the cachexia said by Cushing to be specific in connection with certain pituitary lesions.

The effects of the operations were controlled by two experiments in which every step of the pituitary operation was performed except actual trau-

matization of the pituitary. Total extirpation of the pituitary was effectually carried out on six animals. All died within thirty-six hours with slow respiration and coma. No observable changes occurred in the genitalia, nor were any definite changes found in the other endocrine organs. The hyperplasia of the thyroid as described by Cushing was not discovered in any of these cases.

In only two cases was it possible to remove all of the *pars anterior*. One dog lived thirty-two, the other seventy hours following the operation. Nothing abnormal was observed in the other endocrine organs after operation. In the five experiments in which partial removal of the *pars anterior* was accomplished, variable results were obtained. In three of the five cases the uterus and ovaries were definitely atrophied. The whole ovary shrinks in size, the graafian follicles degenerate, the primordial ova become opaque and lose their chromatin fibers, the interstitial cells vanish and the stroma becomes fibrous.

One experiment each was performed for the total and partial removal of the *pars posterior*. No lesions of the endocrine or sex glands were noted in either case. Combined partial anterior and posterior lobe removals were performed in two cases. No changes occurred in either of these animals. Clamping and separation of the stalk probably produced identical results. Of the three dogs on whom these operations were done, two assumed a condition of *distrophia adiposo-genitalis*. The changes in the adipose and glandular tissues were quite typical of the clinical picture in human beings.

Three experiments were performed to place an imitation tumor in the *cella turcica*. One dog was killed immediately after the operation because it seemed to be suffering intense pain, one animal had considerable emaciation and slight glycosuria; other complicating conditions made it extremely doubtful if the tumor had anything to do with the condition.

Before summing up his own conclusions, the author discusses at length the results of his own experiments compared to the results obtained by other investigators. His own conclusions follow verbatim:

1. The pituitary body is an organ that is essential to life; its removal causes death within a few hours. In the cases which survive for longer periods, the removal has probably not been complete.

2. The removal of very large portions of the *pars anterior* is incompatible with life. It appears certain from the evidence at disposal that it is the loss of this portion of the organ which proves fatal when total extirpation of the pituitary is practised.

3. Partial removal of the *pars anterior* may, if sufficient quantity be removed, cause genital atrophy. This may occur in the absence of any other symptom, although the animal may also remain undersized.

4. Neither partial nor complete removal of the *pars posterior* causes any symptom. The genital

organs remain normal after operation, and young animals continue to develop. Hence the secretion of the pars nervosa is neither necessarily beneficial nor essential to life.

5. Partial removal of the partes anterior and posterior causes no symptom, provided only a small portion of the pars anterior be removed.

6. Clamping and separation of the infundibular stalk, by interfering with the blood supply and so causing degeneration in the cells of the partes anterior and intermedia, lead to the condition known as dystrophia adiposo-genitalis.

7. Artificial tumours in the neighborhood of the cella turcica may produce irritation, which is accompanied by glycosuria and emaciation; or by interfering with the blood supply may lead to degenerative changes in the cells of the pars anterior, and so give rise to the syndrome dystrophia adiposo-genitalis.

8. The pituitary body appears to be one organ and not two; and the essential and beneficial secretion is taken up by the blood stream, as in the case of other organs of internal secretion.

ELLIS FISCHEL.

NECK

Kahn, L., and Graves, S.: Hygroma Colli. *Ann. Surg.*, Phila., 1918, lxxvii, 71.

The authors state that hygroma colli is relatively rare. A careful collective investigation of international literature was made by Dowd in 1913. Since then 5 other cases have been reported. An additional case is reported by the authors. The cyst was completely excised, and the pathological report was that of a multiple hygroma colli.

These multilocular, serous, cervical cysts in children are probably due to distention of embryonic sequestrations of lymphatic tissue. They are usually lined with endothelium, and have the power of persistent irregular growth. Trauma, in some cases at least, seems to be a decided factor in stimulating this growth. Their inherent power of development is sufficient to force themselves into surrounding structures.

In multilocular hygroma the serum in one compartment may be clear, while in an adjacent one it may be tinged with hemoglobin. After birth the growth may show a capricious enlargement with no tendency toward spontaneous recovery. The aggregation of cysts, although presenting superficially, originates from the deep cervical fascia and most often appears in the posterior triangle of the neck. In the submaxillary region its clinical differentiation from branchial cyst is not always easy.

According to Murphy, after partial removal the tumor has returned with enormous increase in size and secretion. This assertion, together with Bloodgood's observation of late malignant development, indicates that the proper treatment of cystic hygromata is early, clean and complete removal.

E. C. ROOS.

Forman, J., and Warren, J. H.: The So-Called "Mixed Tumors" of the Salivary Glands. *Ann. Surg.*, Phila., 1918, lxxvii, 67.

The authors have studied seven cases of the so-called "mixed tumors" of the salivary glands, and they offer a possible explanation of the relationship of the parenchyma cells to the stroma cells. It is generally agreed that these tumors take their origin in foetal misplacements. They contain elements whose origin has been assigned either to ectoderm, to mesoderm, or to a combination of both of these germ layers.

Four of the specimens occurred in the parotid and three in the submaxillary gland. In gross appearance, the specimens fall readily into four groups:

1. A group of very fibrous tumors with no mucoid degeneration or cartilage formation.

2. A group of very hard, dense tumors with large amounts of cartilage and very little fibrous tissue or parenchyma.

3. A group of very soft, very cellular tumors with trabeculae of transparent mucous tissue running in and surrounding the areas of the parenchyma which are yellowish in color and opaque in appearance.

4. Tumors closely resembling carcinomata.

Injury does not appear to be an important factor in the development of these tumors. Metastasis appears rare, while local recurrence is not infrequent.

From the various quotations and writings of others it is apparent that the difficulty in assigning an origin to these tumors is in the behavior of the so-called parenchyma cells.

The authors take into consideration that the derivation of some of the head cartilages can be ascribed to epithelium. They are of the opinion that there is a possibility if not a probability that there is in the head and branchial region of the human embryo mesenchyme which has been derived from ectoderm. Later this may differentiate into cartilage and possibly into other derivatives generally assigned to mesenchyme derived from endoderm. The inclusion or misplacement of this ectodermal mesenchyme gives rise to the so-called "mixed tumors" of the salivary glands. Either the cells fail to differentiate and simulate the cells from which they arose, or they differentiate along the lines they normally do and form connective tissue, cartilage, and sometimes bone.

E. C. ROOS.

Carter, W. W.: Salivary Calculus. *Laryngoscope*, 1917, xxvii, 881.

The author details a personal case and advises operation through the floor of the mouth unless there is an external fistula or an abscess of the gland.

The technique employed in the author's case was as follows: Morphine, gr. $\frac{1}{4}$, and atropine, gr. $\frac{1}{150}$, was injected hypodermically. The area is cocaineized, superficially and deeply. The patient lies on the affected side with the tongue protruded to the opposite side.

The stone is located by bidigital palpation; the patient is directed to push the gland forward and upward by placing the thumb under the angle of the jaw.

The tissues are fixed by means of a pair of forceps and an incision is made down to the stone, which is then grasped with the forceps and removed. Care should be taken not to injure the lingual nerve, the maxillary artery, or the facial artery. The wound should be left open and frequently irrigated.

OTTO M. ROTT.

Denis, W., Aub, J. C., and Minot, A. S.: Blood Sugar in Hyperthyroidism. *Arch. Int. Med.*, 1917, xx, 904.

Since and even before the advent of modern methods for the determination of blood sugar, the spontaneous glycosuria so frequently observed in patients suffering from hyperthyroidism has led several investigators to make studies on blood sugar in this disease. These studies have led to conflicting results. Tachaw and Flesch found an alimentary hyperglycemia in some cases, but not in others. In 40 cases the latter investigator reported not a single instance of spontaneous hyperglycemia. On the other hand, Geyelin, from a study of 27 cases of hyperthyroidism, concluded that an unmistakable hyperglycemia can be demonstrated in 90 per cent of the moderate and severe cases, while even in mild types of the disease an alimentary hyperglycemia, two hours after 100 gm. of glucose, could frequently be demonstrated.

In view of this lack of uniformity in the results reported, it seemed worth while to the authors to carry out a series of experiments dealing with the effect produced by carbohydrate ingestion on persons suffering from hyperthyroidism. Coincident with these experiments they made observations on the gaseous metabolism of these patients, with the idea of establishing, if possible, some relation between the increase in metabolism found in this condition and the effect produced on the blood sugar level by the ingestion of carbohydrates. From their study the authors draw the following summary:

Fasting hyperglycemia was of extremely rare occurrence in hyperthyroidism. Alimentary hyper-

glycemia following the administration of 100 gm. of glucose and 50 gm. of bread was, however, observed in every case examined.

No relation could be found between the degree of hyperglycemia and the intensity of glycosuria; neither was it possible to obtain any evidence of a relation between the severity of intoxication, as measured by the percentage increase over normal of the basal metabolism, and the occurrence of hyperglycemia. In a number of cases it was found, however, that after improvement of the patient's condition by rest or by operation the alimentary hyperglycemia was of a much lower grade than that induced by the same test meal given before treatment.

In two cases of hypothyroidism no change in the fasting blood sugar level was observed to result from the administration of thyroid extract.

GEORGE E. BEILBY.

Else, J. E.: Surgical Goiter. *Northwest Med.*, 1918, xvii, 16.

Indications for operation upon the thyroid gland may be: (1) cosmetic, (2) mechanical, (3) toxic, and (4) malignant. The cosmetic and malignant types are not considered. The mechanical indications are those due to pressure, as upon the trachea, esophagus, nerves, and adjacent blood-vessels.

Intrathoracic goiter may consist of: (1) a single enlarged lobe, (2) both lobes, (3) portions of one or both lobes, and (4) a true substernal lobe, a congenital anomaly being an atypical lobe below the isthmus.

Hyperthyroidism may be either functional or organic. The organic may be benign or malignant. Benign hyperthyroidism is of two types: (1) exophthalmic or hyperplastic, or (2) toxic or cardiovascular goiter. The latter pathologically is due to at least three lesions, viz., adenoma, adenomatosis, and regeneration or compensatory hyperplasia. Each of the three is described briefly. Clinically they produce manifestations that are alike and which resemble the symptoms produced by other slowly administered toxic substances. Parenchymatous goiter is described pathologically.

Three case histories are given.

CARL R. STEINKE.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Crymble, P. T.: Gunshot Wounds of the Chest. *Brit. J. Surg.*, 1918, v, 363.

This article is based upon 211 cases observed during fifteen months in a base hospital in France and twelve months in a similar hospital in England. The most important part of the X-ray examination of the chest is to inspect the two domes or cupolæ of the diaphragm. The right dome cannot be dis-

tinguished from the shadow of the liver except when a subphrenic collection of gas is present. The left dome is normally defined by the gastric gas bubble. There is usually a deficient movement of the diaphragm in a perforating wound of the thorax and frequently there is complete immobility. The latter condition is also an accompaniment of lung collapse, being found on the same side as the collapse. If an opaque lung area is present in the supradiaphragmatic area it may prevent observa-

tion of the movements of the diaphragm. If the opacity be due to fluid, the diaphragm may be visible in the lying position. On the left side the presence of a stomach gas bubble will enable one to note the position and movement of the diaphragm where the left lung area is opaque.

The defective movement of the diaphragm can be looked upon as a protective reflex fixation in those cases where the lung area above is clear.

If, however, fluid in the pleural cavity or a wound of the lung is present or the bronchi are obstructed, the diaphragm is drawn upward during inspiration and the mediastinum drawn toward the affected side. This is best seen in lung collapse and in hemothorax.

Adhesions between the costal and diaphragmatic pleura, or between the visceral and diaphragmatic pleura, will cause permanent defective movement and marked alteration in the shape of the cupola during inspiration. Marked elevation of the right cupola was noticed in a case of subphrenic abscess where a large quantity of gas accumulated between the liver and the diaphragm, and again in a case of injury to the right phrenic nerve. Marked elevation of the left cupola was noted in left lung collapse and could be detected both radiographically and by percussion by the abnormally high position of the stomach and colon gas bubbles.

Localization of metallic foreign bodies is best carried out by anteroposterior and lateral fluoroscopic views and then taking stereoscopic plates with the foreign body as near the plate as possible. The entire examination is made with the patient in the lying position, and a skin-mark is made over the most adjacent portion of rib. In taking the plates, the patient is instructed to hold his breath, and an exposure of ten to fifteen seconds, without an accelerator screen, is usually sufficient. A much longer exposure will be required in the presence of a hemothorax.

Crymble differs with those who advocate non-interference unless the foreign body is in the pleural cavity and giving rise to symptoms. His own experience based on ten cases is that the removal of these intrathoracic metallic foreign bodies can be readily done and does not influence the convalescence unfavorably.

Two inches of rib are resected, the pleural cavity opened, if necessary the lung incised, and the missile located by palpation. In the presence of adhesions no pneumothorax will take place; otherwise, the palpating finger will fairly efficiently block the pleura opening. Foreign bodies in the lung are easily palpated, and the intervening lung tissue is often friable, so that the finger can accomplish the loosening of the metal fragment, and forceps can extract it. After the removal has been accomplished, one closes the pleural opening and tightly sutures the overlying muscles and skin so as to prevent any communication with the outside air. The wound of the lung appears to close rapidly, and the air is ultimately absorbed from the pleural cavity.

When possible the patient should be examined both in the lying and sitting positions, with the rays passing dorso-ventrally, and the apparatus should be capable of giving a satisfactory result with a plate exposure of five seconds with an accelerator screen. Stereoscopic plates are almost indispensable for a proper study of injuries of the thorax.

A very large quantity of fluid will render the whole of one lung area opaque, while a small collection will produce a supradiaphragmatic opacity in the sitting position. In the lying position, fluid disseminates itself through the pleural cavity, and produces a moderate opacity of the whole lung area. The nature of the pleural fluid cannot be determined radiographically.

Gas in the pleural cavity, associated with retraction of the lung from the lateral thoracic wall, is revealed by the presence of an opaque line produced by the lateral margin of the collapsed lung, and even quite small collections of gas may disclose themselves in this way. Where, however, owing to fresh or old adhesions between the lung and the lateral thoracic wall, lateral collapse of the lung cannot take place, the gas tends to collect in front of the lung, and fails to alter the appearance of the lung area. In one case, a large pneumothorax was not recognized at the X-ray examination, but was subsequently revealed by exploratory puncture and confirmed by postmortem examination.

Traumatic infarct of the lung is the condition produced by contusion or laceration, and it gives rise to an opacity of the lung area involved.

Gas and fluid in the pleural cavity give rise, in the sitting position, to a very characteristic picture, since a sharp horizontal line marks the junction of the opaque fluid with the transparent gas. During screen examination this gas-fluid junction may show waves, bubbles, or splashing. When the lower part of the lung is involved, some difficulty may be experienced in distinguishing a traumatic infarct from a small hemothorax, and frequently the latter condition accompanies the former.

Pneumonia gives rise to an opacity of the lung area involved with no displacement of the heart.

Pasteur (*Brit. J. Surg.*, 1914, i, 587) was the first to describe this condition in association with diphtheria and as a sequel to abdominal operations. Bradford (*Brit. J. Surg.*, iii, 247 and *Brit. M. J.*, 1917, Aug. 4) has pointed out the frequency with which this condition accompanies gunshot wounds of the chest, and was the first to suggest massive collapse as the explanation of certain puzzling radiograms, the outstanding feature of which is opacity of the lung area with retraction of the heart toward the opaque side.

In ten of Crymble's fifteen cases of massive collapse of the lung, the condition was found on the side opposite to that injured, and in five it was present on the same side as the injury. It shows as an opacity associated with a high and immobile diaphragm, the mediastinum being retracted toward

the opacity. The latter disappears in one to two weeks. Collapse as a rule affects only the left lower lobe, but in one case the entire lung was involved and in another only the apex.

A brief summary is given of the X-ray and physical findings in the various conditions resulting from injury to the chest. Altogether this article upon the X-ray findings is the best which has thus far appeared, and a study of the excellent radiograms accompanying the details of each case can be warmly recommended. D. N. EISENDRATH.

Rees, W. A., and Hughes, G. S.: Wounds of the Chest as Seen at an Advanced Operating Center. *Lancet*, Lond., 1918, cxciv, 55.

The figures and analyses in this paper are based on 140 consecutive cases of uncomplicated chest wounds seen early after injury, during a comparatively quiet period of six months. The wounds are classified as "closed" in case the wound is small or valvular preventing air passing in and out with the movements of respiration, and "leaking" in case air or bubbles escape from the wound on respiration, when the patient coughs, or is rolled over. The earlier the patient is seen, the larger will be the proportion of "leaking" to closed cases, since many wounds close spontaneously in the first twenty-four hours.

Primary hæmorrhage into the pleural cavity is common to both. It is the chief cause of death during the first few hours after receipt of a wound of the chest. When severe, the patient is blanched and very restless. In the worst cases morphia may fail to control restlessness because the drug is not absorbed by the failing circulation. In 12 fatal cases 9 were pulseless on admission, in the other 3 the pulse rate was between 130 and 140. There were 7 other fatal cases of primary hæmorrhage complicated by other injuries.

Treatment in these serious cases is mainly expectant. Patients with a readily perceptible pulse may die suddenly if rolled over on the sound side within twelve hours after being wounded. Bleeding does not usually continue after twenty-four hours.

It usually comes from the deeper blood-vessels in the lung. Nature's method of arresting it is to cause collapse of the lung. The pressure on the lung by the accumulated fluid in the pleural cavity will not by itself assist much in the arrest of the hæmorrhage. No single case of hæmorrhage from an intercostal artery has been seen. Plugging of the wound is therefore of no benefit except after the lung is collapsed, when it may improve respiration by rendering the entrance of air into the chest easier by respiratory passages than through the wound.

Hæmoptysis was present in 65 of 100 cases of undoubted penetrating wounds of the lung. In no case was it severe enough to cause anxiety.

Leaking pneumothorax was present in 44 cases with a mortality of 61 per cent. Excluding 18 fatal cases that died early, there were left 26 who lived long enough for the pleura to become grossly infect-

ed. Of these, 15 became septic and 9 died. The proportion of leaking pneumothorax which became infected was then 57 per cent, five times the proportion in closed hæmorrhax. The question of sepsis is therefore a very important one and is dependent on the size of the opening in the pleura. Any wound which leaks air or blood and pleural fluid freely after forty-eight hours will become septic. Convalescence and invalidism is also greatly prolonged.

Treatment of these leaking cases is by simple dressing, by plugging the wound, or by sewing up the wound with or without removal of foreign bodies. The simple dressing is sufficient in case of small wounds. Air will cease to leak in twenty-four to forty-eight hours. If it continues or if the discharge persists, sepsis is almost certainly present and resection and drainage is indicated.

Plugging the wound is done to arrest hæmorrhage and to prevent the entrance of germ-laden air. It is, however, difficult to render a large wound airtight with gauze and there is danger of introducing germs from the edge of the wound.

Sewing up of the wound is advisable in all cases, since by this means infection can be prevented in more than half the cases. The removal of foreign bodies from the lung is justifiable only in selected cases. About twelve hours after being wounded is perhaps the best time for suture. Shock should have passed off and hæmorrhage ceased before operation. Chloroform and warmed oxygen is the most suitable anæsthetic following morphia and atropin. The suturing takes only a few minutes. Muscle and pleura are sutured with catgut, the last stitch being drawn tight during expiration, and the skin with silkworm gut. If the pleural contents are infected the wound will become moist in forty-eight hours. The stitches are then removed and a tube inserted. In general these cases are bad operative risks and operations should be as speedy and simple as possible. Nothing is gained by sewing up holes or tears in the lung.

Only those cases of closed hæmothorax giving rise to physical signs and proven by the syringe are included in this series. Closed hæmopneumothorax differs in no way from hæmothorax except in greater liability to increased intrathoracic pressure and cardiac displacement. Air in these cases comes from the lung. There were 72 cases of hæmothorax and closed hæmopneumothorax, with a mortality of 19.3 per cent. Of the fatal cases, 5 died from internal hæmorrhage. Of the 67 that survived 48 hours only, 11.9 per cent died from this cause.

The average stay of the hæmothorax cases at the advanced station was seven days. The three patients who recovered following rib resection showed signs of infection on the fifth, tenth and thirteenth days, respectively. Rapid pulse, sustained temperature and localized pain in the chest are signs of infection of hæmothorax. Chest cases should be examined every day, especial attention being directed to the position of cardiac impulse. Aspiration should be

performed when there is cardiac displacement of one inch or more. All the fluid that will run off easily is removed slowly at the rate of about an ounce per minute. Practically all hemothorax cases require aspiration.

Of miscellaneous complications, collapse of the wounded lung, pleurisy, secondary hemorrhage from the lung following sepsis, and cardiac complications are mentioned.

Collapse of the lung is most marked in cases of pneumothorax or very large effusions. It is one of nature's most potent methods of arresting hemorrhage. Massive collapse will occur also in the wounded side when there is very little hemothorax and no raised intrathoracic pressure. It also is fairly common on the side not wounded. Two factors assisting in this are cessation of movement of the diaphragm and a blood clot completely blocking a bronchus. In these cases the apex beat is pulled over to the side of collapse, the diaphragm is raised, the affected side is immobile, and the respiration is increased greatly on exertion. C. A. HEDBLÖM.

Carpi, U.: Treatment of Penetrating Thoracic Wounds (*Perite penetranti del torace e loro cura*). *Policlin.*, Roma, 1917, XLIV, ser. prat., 1432.

The author treated 137 cases of penetrating chest wounds. The mortality was 28.4 per cent. He gives the following statistics:

Nine, or 6.5 per cent died as a result of thoracic lesions. Thirty, or 21.8 per cent died from thoracic lesions complicated with lesions of other organs.

These figures show the interesting fact that only 6.5 per cent of the mortality resulted from simple thoracic lesions. The author states that his figures compare favorably with the statistics of other contemporary surgeons, as for instance, Remond and Glénard, who give a mortality of 5.45 per cent; Guleks, 5.35 per cent; others give a higher rate: viz., Tillage, 9.6 per cent; Rotter, 12.12 per cent; l'Auge, 19 per cent; Maissonnet, 20 per cent; Lemaitre, 19 per cent; Morelli, 25 per cent; and Bastianelli, 24 per cent.

The author discusses the symptomatology of the wounds. As regards treatment, he thinks that the removal of all blood clots in the pleura and the employment of artificial pneumothorax following the Forlanini method is the only treatment which assures definite repair of the wounds and restores the respiratory function in the injured lung.

The maintenance of pneumothorax by the regular technique is the rule in cases in which the projectile is retained in the cavity and presumably in the lung. W. A. BESSAN.

Pisek, G. R.: Report of a Case of Chylothorax. *Arch. Pediat.*, 1917, XXIV, 929.

The patient was a full term breast-fed normal baby of nine weeks. There was a history of sudden illness ten days before, followed after a few hours by a convulsion. Rapid breathing was the only other symptom. The attending physician diagnosed

pneumonia. The physical examination showed cyanosis, restlessness, a respiration of 60 to 90 per minute; there was no fever. Aspiration over the flat area of the right chest yielded a milky fluid, of which six ounces were withdrawn. The child's color then improved and it took the breast better.

A laboratory examination showed a sterile colloid fluid composed of 3.5 per cent fat and seroglobulins and containing about 12,000 leucocytes per cmm.

Nine ounces of similar fluid were withdrawn five days later, with relief of dyspnea, etc. A radiogram showed effusion in the right chest, with displacement of the heart to the left. The blood and urine examination was negative.

To prove the character of the fluid, 7½ grams of sudan III were given the baby. Bright red stools followed. Thoracentesis eighteen hours later yielded a pink stained chylous fluid.

The baby became free of symptoms during three weeks' stay in the hospital and gained weight. Aspiration now yielded no fluid.

It is necessary to distinguish between true and pseudo-chylothorax. Both forms are rare. Bargebuhl in 1895 reported 22 true and 19 pseudo cases. Sherman in 1907 tabulated 11 cases under fourteen years. The author believes his case the youngest on record. He considers trauma, new-growths, tuberculosis and thrombi as etiological factors. The convulsion may have been etiological in this case. The mortality in true cases is given at 50 to 75 per cent, in the pseudo form at 40 to 50 per cent. Thoracentesis rather than resection is the best treatment. C. A. HEDBLÖM.

Campbell, J.: The Treatment of Septic Hemothorax and Empyema. *Brit. M. J.*, 1918, I, 109.

Many cases of septic hemothorax in the early stage can be successfully treated by thoracotomy and careful removal of all fluid and clots, followed by washing out with Dakin's solution and complete closure of the pleural cavity. This treatment, however, is of no avail in half of the severe septic cases, and drainage is followed by long-continued fever and exhausting suppuration. Campbell has found in a number of cases that it is superior to any other for the severely septic cases. An X-ray examination is first made and any foreign body localized.

Under a general anesthesia the wound is explored, the fractured portions of rib resected, and the wound sewn up if its condition allows. The pleural cavity is then drained in the usual fashion, resecting about three and a half inches of rib as far forward and as low as possible, that is, usually the eighth rib in the mid- or anterior axillary line. Through this opening the cavity is explored, and an easily accessible foreign body and fragments of loose bone lying in the cavity or on the surface of the lung are removed. Blood-clot and fibrin are swabbed out as far as possible, and any septa forming loculi broken down.

The cavity is next washed out with a warm mixture of hydrogen peroxide and eusol, or Dakin's

solution. A rubber tube with an internal diameter of a quarter of an inch, with a large lateral opening a quarter of an inch from one extremity, is then inserted, so that this end lies in the most dependent part of the pleural cavity when the patient is lying on the *normal* side, that is, in the costovertebral recess behind the pericardium. Finally, the wound is loosely sewn up, but no attempt is made to effect an airtight closure around the tube.

When the patient has recovered from the operation, the size of the cavity is estimated by filling it carefully, but usually incompletely, with warmed Dakin's solution, and then emptying it. After this the cavity is filled through the tube every four hours to about one-third of its capacity or less with Dakin's solution. At the end of two hours another long tube is attached to the tube in the chest and the fluid siphoned out, the patient meanwhile lying on the sound side with the chest opening uppermost, or as nearly so as possible. The patient is told to pant or cough slightly at frequent intervals as long as the fluid remains in the chest, and by this means splash the fluid about inside the cavity, and so bathe with it the entire infected surface and any recesses that may exist.

In this way the pleural cavity contains for two hours a large quantity of sodium hypochlorite solution, and is more or less empty for a like time. During the former period the patient lies rigidly on the sound side, without any raising of the shoulders, to prevent escape of the fluid and consequent flooding of the bed; during the latter he is free to lie as he chooses. Thus the patient gets a reasonable amount of rest and comfort and is saved the exhaustion associated with the maintenance of one constant position. In addition, once daily the tube is removed, sterilized, and replaced, and the cavity washed out as in the usual treatment for empyema.

To overcome the disadvantage of injecting cold fluid into the chest, the author has found that it is better to make Dakin's solution of double strength and, prior to filling, to dilute it with an equal quantity of warm sterile water.

D. N. EISENDRATH.

Sergeant, E., Pruvost, P., and Labro, P.: **Functional Disturbances Attributable to a Lesion of the Cardiac Plexus and of the Mediastinal Nerves in Chest Wound Cases** (*Troubles fonctionnels imputables à la lésion du plexus cardiaque et des nerfs du médiastin chez les blessés de poitrine*). *Ann. de méd., Par.*, 1917, v, 473.

In cases of chest wounds, a certain number sooner or later complain of oppression, palpitations, and thoracic pain, even when a complete stethoscopic as well as radioscopic investigation shows the absolute soundness of the heart, pericardium, lungs and pleura.

Some of these cases are exaggerating or shamming, others are nervous or suffering from shock; but all are not. In some a thorough examination makes functional disorders evident by revealing

the existence: (1) of symptoms due to a lesion of the cervical sympathetic or of the vagus nerves; (2) of symptoms due to a lesion of the phrenic nerve.

In some cases the projectile has remained in the body of the patient, whose complaints may be verified by the fact that the presence of this projectile can be discovered in the region of the large vessels, at the base of the heart, or in the region of the cardiac plexus.

The author relates ten cases in support of his argument. In five of these hyperthyroidism was observed; in three phrenic neuralgia; in four pupillary irregularity; and in two vasomotor disturbances. In such cases the desirability of extracting a retained projectile must be considered.

W. A. BRENNAN.

TRACHEA AND LUNGS

Duval, P., and Vaucher, E.: **War Wounds of the Lung** (*Les plaies de guerre du poumon*). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 2243.

The authors report 161 cases of lung wounds. The mortality was 16.7 per cent. These include all cases, even those arriving dead at the station, and cases where death resulted from other than the pulmonary wound.

The mortality in 29 cases where an urgent operation was done for hæmorrhage or an open thorax was 44.8 per cent.

Deducting these 29 and 13 dying without any operation from the 161 cases leaves 119 cases. Of these, 17 were operated upon for the extraction of projectiles or for direct treatment of the lung wound. All others were treated medically. Duval therefore has only operated on 28.5 per cent of ordinary lung wounds. The 17 operated cases all resulted in recovery. Of the 101 cases medically treated, there was 1 death from pleural infection and 10 other cases of pleural infection which recovered.

The operative indications in lung wounds are both general and particular, according to the given case. Duval thinks that projectile wounds of the lung are not different in their general aspect and progress from other projectile wounds. Anatomically, bacteriologically, and clinically, such lesions are the same, and it is logical to treat the lung as any other damaged tissue: remove the foreign bodies, excise the contused tissues, and primarily suture the aseptic wound.

Apart from their general indications there are particular indications in given cases. Such are: (1) the presence of a thoracic parietal fracture; (2) a large projectile included in the lung; (3) pulmonary hæmatoma; (4) the co-existence of other wounds in the thorax or abdomen. The authors discuss each of these types.

In the operative technique every effort ought to tend towards the complete treatment of the wound of the lung. Every postoperative septic complication observed by the authors was due to the

fact that the lung lesion was insufficiently treated. Small bone or other fragments were found in the pus.

With regard to the most opportune time for operating, a lung wound, like any other wound, is best operated upon before it becomes infected or before the infection has spread to the pleura. The best time is usually within the first twelve hours if the general condition is good.

The 17 operated cases which recovered included 12 perfect recoveries and 5 cases with septic complications.

Duval favors the present-day treatment of war wounds of the lungs by early surgery. Lung wounds should be treated according to the same general and local principles as apply to every other war wound.

W. A. BRENNAN.

Tanton and Others: Surgical Treatment of Lung Wounds. (*Traitement chirurgical des plaies de guerre du poumon*). *Bull. et mêm. Soc. de chir. de Par.*, 1917, xliii, 2235.

In submitting statistics of Tanton and others regarding the surgical treatment of open thoracic wounds, Duval points out that closure of the thorax is only a palliative procedure which obviates threatening asphyxia. It transforms an open thorax into a closed thorax, but leaves the lung and pleura exposed to all the dangers of wounds of these organs.

Thevenot's mortality for thoracic closure is 24 per cent, the same as for non-operated shell wounds of the lung. The statistics now submitted again demonstrate these facts and show that closure of the thorax, in itself an excellent procedure, should be supplemented immediately or as soon as possible by an operation on the lung wound similar to that usually undertaken for uncomplicated war wounds of the lung.

W. A. BRENNAN.

McMahon, F. B., and Carman, R. D.: The Roentgenologic Diagnosis of Primary Carcinoma of the Lung. *Am. J. M. Sc.*, 1918, clv, 34.

The author describes in detail the pathologic, symptomatic, physical and roentgen findings of various types of primary carcinoma of the lungs. The chief roentgen characteristics of the infiltrative types are described as areas of increased density along the roots of the larger bronchi. These are wedge-shaped, with the apex pointing toward the hilus, and the base not reaching the periphery until late in the disease. Their outlines are usually hazy. In the miliary type there are innumerable small areas of increased density extending throughout all the lobes. Their borders are poorly defined from the surrounding parenchyma of the lung. The mixed type includes a combination of the infiltrative and miliary forms.

The differential diagnosis from bronchiectasis, pulmonary abscess, encysted empyema, lobar pneumonia, syphilis, primary sarcoma and lymphosarcoma, Hodgkin's disease, actinomycosis, cysts, fibromyxoma, tuberculosis, pneumoconiosis, chronic passive congestion, simple chronic pleuritis, pleural

transudates and exudates, and metastatic malignancies of the lungs, is outlined. Histories with roentgenograms of five cases are given, three of which were verified by autopsies and one by operative findings.

The authors arrive at the following conclusions:

1. There are three main types of primary carcinoma of the lungs which present characteristic gross pathological appearances: the infiltrative, the miliary, and the mixed.

2. The roentgen examination and the stereoscopic study of roentgenograms will early point to a pulmonary lesion and its probable nature.

3. The areas of increased density found in primary pulmonary carcinoma are usually quite typical, and can be differentiated from areas of increased density caused by other diseases in the thorax, including inflammatory changes and neoplasms, both primary and metastatic.

4. A careful correlation of the roentgen findings with the clinical history and the physical and laboratory findings usually makes a clinical and differential diagnosis possible. ADOLPH HARTUNG.

Black, H. R., and Black, S. O.: Pulmonary Teratoma. *Ann. Surg.*, Phila., 1918, lvii, 73.

The patient was a white male of 46 years, with an essentially negative family and past history. His chief complaint was persistent soreness through the left chest, an occasional cough and some dyspnea, which he attributed to trauma ten months previous.

Physical examination showed a slightly diminished respiratory excursion and vocal resonance on the left side. There was dullness and absent breath sounds from the fifth to the eighth interspaces posteriorly.

Aspiration in the sixth interspace posteriorly yielded 30 ccm. of blood tinged yellow with serum. Smears and cultures showed no micro-organisms. A radiogram showed a large round shadow in the left lung. A later plate showed an increase in the size of the shadow.

Under ether anesthesia a quadrangular flap including the sixth to the eighth ribs was turned back over the vertebral column. Thickened, bulging, pulsating pleura seemed adherent to the lung. Caustic puncture yielded a yellowish serum. The finger barely reached the anterior wall of the cavity. The patient left the hospital after one month much improved, but the wound still drained. After a few weeks it increased and became foul. Slight fever, cough and pain continued with progressive weakness. About four months after operation he had three definite attacks of hæmoptysis, in the last of which he died.

Sections of tissue removed at operation and again after death were diagnosed by Coplin of Jefferson Medical College as pulmonary teratoma. There were also a few carcinomatous cells.

Teratomata are commonly solid neoplasms. Dermoids practically always are cystic. They

spring either from embryonic cutaneous inclusions or from the growth of a misplaced and blighted ovum. When not congenital they develop from nests of epithelial cells which are carried into the deeper tissues during the inception of a punctured wound. Both these tumors may be classified therefore as being congenital or acquired in point of origin, and as being external or internal in point of location. Examples of external teratomata are the Siamese twins, polydactylism, spina bifida, etc. Internal teratomata are far more frequent and are the types usually designated by the term.

Dermoids are distinctly more common than both types of teratomata combined. They are made up largely of dermal tissue plus one or more of its appendages, while teratomata are tumors of a peculiar mixed histologic composition and are described by some as containing tissues, organs, or systems of organs, derived from two or all of the germ layers. Dermoids are spoken of as structures of slight complexity and teratomata as structures of great complexity. The ovary testicle, sacrococcygeal region, and mediastinum, in the order named, are the most frequent sites of these tumors.

Hare's analysis in 1888 of 520 cases of mediastinal tumors included 8 dermoids and one unquestionable teratoma. Christian in 1907 analyzed 70 cases, 7 of which were teratomata, the remainder dermoids.

Bland-Sutton observes that these tumors in the mediastinum originate from cutaneous or subcutaneous inclusions of cells, with their subsequent dislocation backward, during the process of folding together of the two halves of the body during early intra-uterine life. These cells may manifest themselves later in life as tumors of the sternum or much more frequently settle in the anterior mediastinum where they may involve the pleura or pericardium. They originate, therefore, not in the lung itself but in the mediastinum. Once in the lung, infection by germ-laden air may lead to suppuration.

Surgical interference is indicated only when circulation or respiration is seriously impaired. Excision *in toto* has been successfully accomplished in only one case.

C. A. HEDBLUM.

Van Reeth, P., Voncken, J., and Stassen, M.: Strangulated Pulmonary Hernia (Hernie pulmonaire étranglée). *Arch. méd. belges*, 1917, lxx, 1142.

In their war practice the authors met a case of strangulated pulmonary hernia. Operation showed that a bullet had passed tangentially over the sixth and seventh ribs which were fractured in the mammary line. The costal breach was hidden by a pulmonary lobule about the size of a pigeon's egg, a true pulmonary hernia. It was compressed between the sixth and seventh ribs. The herniated lung tissue was violet in color. Blood squirted at every respiratory movement.

The herniated lobule was seized by a compress soaked in warm salt solution, cautiously freed and

reduced into the pleural cavity. Resection of the fractured ribs was then done. The pleural cavity was cleared of accumulated blood. The freed lung lobule was carefully examined and cleaned; and since its general condition was found good, they decided to save it. The pleura was very ecchymotic. The whole region was cleansed of blood clots, the pleural cavity washed out with salt solution, intercostal vessels ligatured and the wound closed. A liter of salt solution was administered at the end of the operation. For two days after operation the patient's condition was critical, but the general state then began to improve; cyanosis and dyspnea diminished. Three months after operation he left the hospital cured.

The authors discuss the occurrence, symptomatology, and treatment of pulmonary hernia. Although the condition is said to be rare, they think it may occur more frequently than is believed, since it has been the general practice until recently not to intervene surgically in lung lesions. When the cutaneous wound is large, an existing hernia is easily apparent; but when the skin wound is small, a pulmonary hernia through the ribs may pass undetected.

As a means to detect the existence of a lung hernia, the authors state: (1) that in the neighborhood of the wound there is often found a small resistant crepitant swelling, a localized emphysema. If such is found, it suggests pulmonary hernia, especially if the patient complains of sharp pains at this point; (2) such patients show convulsive and painful dyspnea; (3) pulmonary hernia must be considered when the traumatic orifices are situated in the soft parts of the thorax. In cases of doubt, a small incision of the parax under local anæsthesia will discover the lesion.

A pulmonary hernia, if not operated upon, is extremely liable to become gangrenous and a fatal issue may be expected from pleural empyema or infectious pneumonia.

W. A. BRENNAN.

HEART AND VASCULAR SYSTEM

Levine, S. A., and Tranter, C. L.: Infarction of the Heart Simulating Acute Surgical Abdominal Conditions. *Am. J. M. Sc.*, 1918, clv, 57.

The authors present two cases which gave the history and presented the signs of an acute inflammatory or perforative lesion of the upper abdomen, but proved to have coronary thrombosis with infarction of the heart. The cases were strikingly similar in their history, clinical course, physical findings, and necropsy examination.

Both patients entered the hospital complaining of acute epigastric pain of a few days' duration in one case and of a few hours' duration in the other. Both had slight nausea and some vomiting, but neither had chills nor fever. Their past histories were essentially negative except for antecedent angina in one.

Physical examination showed marked tenderness

in the epigastrium in each case and a questionable mass in the region of the gall-bladder, over which the percussion note was dull. The pulses were of poor quality, slightly rapid, and the heart sounds were feeble. In neither case were cardiac murmurs heard, the apex beat was neither seen nor felt, and cardiac dullness was slightly increased in the second case. One case developed complete heart block shortly before death.

The blood-pressure in both cases was low; the pulse-pressure in the first case was only 12 and in the second 26. There were anomalous signs in the right lower chest in both instances, consisting of a moderate number of râles at one time and subsequently a diminution of the breath sounds throughout both lungs.

The acute epigastric pain and tenderness, together with a leucocytosis of about 20,000 and a moderate fever in both cases, made the diagnosis of an acute inflammatory or perforative lesion of the upper

abdomen seem probable. The conditions considered were perforated gastric ulcer, acute pancreatitis, and acute gall-bladder disease.

A laparotomy with negative findings was performed in the first case. The mild diabetes with acidosis in the second case, together with the drowsiness, influenced the surgeons to consider that the patient might be on the verge of coma, and dissuaded them from operation.

The condition above described bears a close relation to angina abdominalis and angina pectoris. Allbutt points out as distinguishing features of coronary embolism from the angina pectoris of the ordinary form the flutter and lability of the heart, the rapid, irregular, and failing pulse, the waning sounds, the dyspnoea, and the cyanosis. He, as well as Hochhaus, Obrastzow and Streschesko, refers to the fact that the pain in infarction of the heart is more continuous than in typical angina.

P. G. SKILLERN, JR.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Delbet, P.: Toxic Phenomena in Peritonitis and Shock (Les phénomènes toxiques dans les péritonites et dans le choc). *Bull. et mêm. Soc. de chir. de Par.*, 1917, xliii, 2113.

Delbet refers to experiments made by him as far back as 1892, as well as recent ones to produce peritonitis in dogs by perforation, collecting the peritoneal exudate and injecting it into other dogs.

He has found that when an animal is injected with the serous exudate of peritonitis, whether the exudate is pure or filtrated through Arsonval's apparatus by which the microbes are completely or partially removed, the result in each case is the same, i.e., symptoms of inflammation of the peritoneum. There are only two hypotheses possible; the action is due either to serous irritation or to an intoxication.

The injection of irritants into the peritoneum does not produce vomiting; injection of serous exudate does produce vomiting within half an hour after injection. Delbet thinks that the vomiting and peritoneal spasm are not due to a reflex consecutive to irritation of the peritoneum, but to an intoxication. The death of the animals within three to four hours after injection points also to intoxication. Delbet thinks that the classic symptoms of peritonitis are above all of toxic origin, and due to the resorption of the toxins produced by the development of microbes in a particular area. Hence such symptoms are inconstant, and the so-called classic symptoms, spasm, vomiting and constipation, may all be simultaneously absent. There is one valuable symptom, however, which is never absent, namely, limitation of the motion of the

diaphragm. It is very valuable because it is produced before the infection has become generalized and shows the extension of the peritonitis. There is always a possibility of saving a patient if intervention is made within a short time of the appearance of this symptom.

Delbet finally shows that in the final phases of fatal peritonitis the symptoms are those observed in the wounded in a state of shock. They are due to an intoxication of the nervous system, more especially the bulb and the sympathetic. This leads Delbet to ask if intoxication does not play a part in some forms of shock. He thinks it does, and others have arrived at the same conclusion. The practical application of the theory of the autotoxic origin of shock would indicate immediate amputation in certain cases irrespective of the state of shock.

W. A. BRENNAN.

De Neen, D. D.: An Experimental Study of Peritonitis with Reference to Calcium Sulphide and Special Reference to Iodine and Ether in Its Treatment. *Am. J. Surg.*, 1917, xxxi, 317.

A series of experiments was made on peritonitis in dogs in order to see whether ether will kill bacteria within the abdominal cavity, and also to learn whether or not it is advisable to close an abdomen without drainage, when large numbers of bacteria are left within the abdominal cavity after an operation.

Calcium sulphide was also used for the same purpose. It was noted that an aqueous solution of calcium sulphide would dissolve dry blood, and the point arose as to whether or not it would prevent or dissolve abdominal adhesions.

Iodine was used in the abdominal cavity, in

some experiments equal parts of tincture of iodine and alcohol, and in others one part of tincture of iodine to ten parts of sterile water.

The author draws the following conclusions:

1. Calcium sulphide has no value as an antiseptic and did not prevent adhesions in these experiments.
2. Ether has no value as an antiseptic in the prevention or treatment of local or general peritonitis.
3. Ether will cause respiratory paralysis when used in large quantities within the abdomen.
4. Ether is irritating and will cause adhesions when used upon the normal peritoneum.
5. Ether aids rather than inhibits infection in the peritoneal cavity.
6. Tincture of iodine and alcohol, equal parts, proved to be extremely irritating and harmful.
7. Tincture of iodine causes adhesions when applied to the peritoneum.
8. Tincture of iodine and water did not prevent peritonitis.
9. Drainage is preferable to calcium sulphide, ether or iodine in the treatment of peritonitis.
10. The peritoneum protects the system against bacteria.

C. A. BOWERS.

Fobes, J. H.: *Hernia Through the Anterior Abdominal Wall in Women. Internat. J. Surg.*, 1918, xxxi, 11.

Excluding femoral and inguinal hernie, the author divides these cases according to frequency into: umbilical, ventral ordinary, ventral post-incisional, ventral post-traumatic, epigastric, and ventral accompanied with procidentia.

A brief résumé of embryological anatomy emphasizing the importance of Richet's fascia is noted in the umbilical type. Infants are treated by the button mould or coin adhesive truss, others by the Mayo plan of overlapping closure. The results of the latter are uniformly successful.

Ventral ordinary type hernie are noted below the umbilicus, involve wide diastasis of the recti muscles, and therefore present a sac with a neck of large diameter. Strangulation is infrequent. Operative treatment consists in a Pfannenstiel type of incision through sheaths of recti, reduction of the sac, overlapping of the recti muscles from side to side, and overlapping of the fascia from above downward. A case is reported from the service of the Metropolitan Hospital, New York City, with a failure from a previous operation of the Morison type, presenting also an inguinal diverticulum of the sac. A cure still present after two years was obtained by closing the inguinal canal from within and performing the operation described above.

Postincisional ventral hernie require for their cure wide, elliptical incisions entering the peritoneal cavity through healthy tissue, the removal of diseased contents, and repair by overlapping of fascia.

The author notes a rare case of true traumatic hernia. The patient received a severe blow in the abdomen below the umbilicus from a plank.

Signs of hernia were present. Incision revealed a complete tear of the right rectus muscle and sheath and a protrusion of the peritoneum containing intestines and omentum. The muscle was sutured at right angles to the tear and the sheath overlapped in the customary manner. Examination six months later showed a cure.

The last case reported is one of procidentia uteri and ventral hernia. Through the transverse incision the abdomen was opened, the uterus split, the endometrium curetted away, the two portions of the uterus sutured to the under surface of the recti with linen thread passed up through the rectus sheath, and the peritoneum closed about the cervix. The recti were then overlapped from side to side and the recti sheath overlapped from above downward. Two months later both procidentia and hernia were relieved.

Erdman, S.: *Inguinal Hernia in the Male. Ann. Surg., Phila.*, 1917, lvi, 702.

The author reports the results of the post-operative observations in 148 cases of inguinal hernia extending over periods of eight to eighteen months. Of these cases, 102 were indirect and 46 direct.

There was no instance of a direct hernia on one side with an oblique one on the opposite side. Of the indirect cases, 40 per cent showed early tumefactions in the scrotum and 22.5 per cent of these were persistent. These included hydroceles, thrombosed veins, distended veins, tunica thickenings, hæmatomata, indurations of the cord and indurations of the testis. In the direct cases only 15.2 per cent showed early tumefactions and 8.7 per cent were persistent.

There were nine recurrences in the series, two being in the oblique cases and seven in the direct. Atrophy of the testicle occurred twice, and there were two deaths, one due to pulmonary embolism on the eleventh day and the other due to pneumonia on the twenty-third day.

From an analysis of these cases, it seems that a persistent hydrocele is a common and important after-result, there being 20 hydroceles in 148 cases. The author believes that direct hernie are acquired and not associated with hydrocele, while oblique hernie are usually developmental, more often right-sided, and often associated with hydrocele of the cord and of the tunica.

GATEWOOD.

Symonds, C. P.: *A Case of Traumatic Hernia of the Diaphragm Proving Fatal Seven Months After the Wound. J. Roy. Army M. Corps, Lond.*, 1917, xxix, 34.

In the case reported, a man was wounded by a bullet which entered over the left scapula. The bullet was removed and the man left the hospital. Later he developed sharp attacks of abdominal pains, with vomiting, etc., and was again admitted to the hospital. His case after examination was

finally diagnosed from X-ray findings as diaphragmatic hernia.

The man was not operated upon until a later attack occurred and his condition was desperate. He died from shock. The autopsy showed a large circular opening near the center of the left dome of the diaphragm. The stomach, great omentum, transverse colon and part of the small intestine had herniated into the thorax. Spontaneous reduction in all probability occurred until the last attack.

The author thinks that even if the patient had been operated upon when first seen, the size of the diaphragmatic orifice was so large that nothing could have been done to repair it.

W. A. BRENNAN.

GASTRO-INTESTINAL TRACT

Lockwood, G. R.: The Symptomatology of Peptic Ulcer. *N. Y. St. J. Med.*, 1917, xvii, 535.

Lockwood warns against too hasty a diagnosis of peptic ulcer and believes that too much reliance is placed on X-ray and laboratory findings. The X-ray frequently fails to show duodenal ulcers. Gastric analysis of the stomach, both after fasting and after the test meal offers the most valuable information.

Hypersecretion, i.e., more than 30 ccm. of gastric juice repeatedly found, is pathological and signifies motor error. Hyperacidity also depends on motor error. Painful hyperacidity indicates an organic lesion. In the case of ulcer, the nearer the lesion to the pylorus, the higher the acidity.

The chief characteristics of ulcer history are: (1) the regularity with which the symptoms appear at a definite hour after meals, (2) the relief afforded by taking food. Other conditions simulating ulcer have not the clock-like precision of appearance of symptoms.

Observation of the case for a long time, together with a careful history and all laboratory findings checked one against the other, is the only way one can diagnose this condition. I. E. BISHKOW.

Troell, A.: Gastric and Duodenal Ulcers from a Surgical Point of View. *Ann. Surg.*, Phila., 1917, lvi, 564.

Troell found in the series studied by him that 76 per cent of 234 gastric and duodenal ulcers were located in the stomach and 24 per cent in the duodenum; 5 per cent of the cases had multiple ulcers.

The time of the appearance of pain gave no definite differential point between duodenal and gastric ulcer. The total acidity was relatively high, i.e., 35, but hyp- and anacidity occurred in both types. The average acidity was lower for cases with residue than for those without, i.e., 40.

The X-ray is more reliable than the motor meal in investigating gastric motility. Ulcer may exist for a time at least and be absolutely painless. Two-thirds of the ulcers relieved by food intake were

in the stomach, and 15 per cent of all cases experienced a relief of pain on vomiting. Pain during defecation is due to perigastric adhesions. Twenty-two stomach and 3 duodenal cases had periodic diarrhea alternating with constipation.

At laparotomy it is impossible to determine by palpation the presence of an ulcer. X-ray is again of importance in directly demonstrating ulcer, especially on the lesser curvature by the "niche." Tenderness over such a niche in the duodenum, gas high in the duodenum, and rapid stomach emptying are valuable signs of ulcer in this section. Radical operative methods are replacing the conservative.

The author carefully analyzes and groups the 234 cases studied according to various operative methods and their results. Resection plus gastro-enterostomy gave better results with fewer necessary secondary operations. K. L. VINT.

Morse, W. E.: The Effect of Various Neutral Solutions on Gastric Discharge, Gastric Secretion and Duodenal Regurgitation. *Arch. Int. Med.*, 1918, xxi, 48.

In a recent publication attention was called to various conflicting experimental and clinical observations concerning the relation of acidity of gastric contents to the rate of gastric discharge. In general, physiologic literature supports the theory that an acid reaction is essential to and hastens gastric discharge up to an optimum acidity of from 0.15 to 0.25 per cent. Some clinical observers found that so-called hyperacidity increased gastric motility, while others considered it a contributing factor in stasis and gastric dilatation.

To test this hypothesis and to secure data concerning the effect of varying chemical conditions in the stomach on gastric secretion and duodenal regurgitation, several series of experiments were undertaken by the author, using different concentrations of neutral solutions.

The conditions imposed were identical with those of the acid series previously reported, namely, first, a normal fasting stomach; second, fluid injections of constant temperature and quantity, but of varying concentrations; third, abolishment of inhibitory reflexes by pithing the spinal cord or sectioning the splanchnic nerve; and fourth, general ether anesthesia. As a check on the foregoing, parallel experiments were made on animals with the pylorus ligated in order to eliminate any errors in the calculation of the rate of discharge from the stomach which might arise from the secretion of an unknown quantity of gastric juice.

From his study Morse makes the following summary:

Solutions of sodium chloride varying from 1 to 10 per cent slightly augmented the rate of discharge of fluids from the stomach of anesthetized and pithed or splanchnicotomized dogs. Solutions of concentration above 3 per cent produced an increase of fluid in the stomach by osmosis, but with the pylorus ligated, the increase exceeded that obtained

with the pylorus patent sufficient to indicate a discharge greater than the discharge with water.

Solutions of sodium acetate slightly retarded the discharge of fluid from the stomach of anesthetized and splanchnicatomized dogs.

The fluid content of the stomach was usually increased when solutions of sodium chloride or sodium acetate were injected in concentration above 3 per cent. This increase was attributed to osmosis exceeding the amount of discharge.

The rate of secretion of gastric juice as computed from the increase of acidity averaged 2.33 ccm. per 30 minutes, when water was injected into the stomach and the pylorus was patent. This rate of secretion was not materially altered by ligation of the pylorus or injection of solutions of sodium chloride, sodium acetate, or tabasco pepper sauce.

The acidity of solutions of hydrochloric acid injected into the stomach of anesthetized dogs with the pylorus ligated was decreased, the rate of diminution increasing with increase in the acidity of the solutions.

The average discharge of water from the stomach was 14.3 ccm. per 30 minutes in 51 trials. By eliminating 11 extreme cases the average for 40 animals was reduced to 10 ccm.

Solutions of tabasco pepper sauce were discharged from the stomach at practically the same rate as water.

The mechanism of gastric discharge did not react to solutions of sodium chloride, sodium acetate and tabasco pepper sauce in the same manner that it reacted to solutions of hydrochloric acid.

GEORGE E. BEILBY.

Témoïn: Gastric Surgery (Chirurgie gastrique). *Bull. Acad. de méd., Par.*, 1917, lxxviii, 737.

In a previous report in January, 1917, Témoïn referred to 186 operations for gastric ulcer in which he demonstrated the necessity not only of establishing a gastrojejunal anastomosis, but also of resecting the pylorus and of extending this resection to include all the inflamed part of the stomach wall. In the present report he states that in 1917 he has done 56 new operations of this kind, with 5 deaths. Only 1 death however can be claimed as due to the operation. In every case excepting four or five, the whole of the pyloric region and even a portion of the gastric wall showed the characteristic signs of inflammation. Some had perigastric lesions, adhesions to neighboring organs, etc.

Témoïn thinks that although gastro-enterostomy was a great advance in the treatment in cases of pyloric atresia, yet it is not sufficient. In such cases it preserves the patient's life. It also has great value when resection is impossible, or when the condition of the patient is such that time is valuable.

But in all other circumstances resection is indicated. When an ulcer is situated in the small curvature, a gastro-enterostomy does not suppress the pain, and danger of perforation remains. The smallest quantity of food passing through the pyloric

orifice produces intense pain; and in cases of perigastric lesions it is necessary to resect and liberate the organ.

The author preserves the vessels of the great curvature. He described his method of vascular decortication in a previous article.

W. A. BRENNAN.

Barber, W. H.: Annular Segmental Gastrectomy. *Ann. Surg., Phila.*, 1917, lxxvi, 672.

The author reports the results of a clinical and experimental study of the comparative motor activity of the stomach following segmental gastrectomy and following the removal of a saddle-shaped piece from the lesser curvature. His results include observations in three cases of segmental gastrectomy for ulcer. The findings seem to agree with those recorded in his experimental work.

In his animal investigations, the author used the open laparotomy method, and his results show that thoracic section of the vagi causes a more rapid and superficial fundic wave with an independent forcible pro- and anastaltic pyloric wave. Triangular gastrectomy was followed by more rapid and more superficial fundic waves, and more superficial incomplete pyloric waves.

Segmental gastrectomy was followed by normal or stronger fundic waves and independent, forcible pro- and anastaltic pyloric waves. Thoracic vagotomy produces an effect similar to segmental gastrectomy, due probably to the cutting off of the inhibitory effects of the vagi upon the motility of the pyloric end of the stomach. If the behavior were due to the mechanical effects, it would seem that the greater resultant wound from segmental gastrectomy should produce the most superficial waves, and the conclusion seems to be justified, i.e., that the relationship is probably dependent upon the discontinuance in the neuromusculature and not to the mechanical results of the respective operative procedures.

GATEWOOD.

Achille, F.: A Rational Constricting Method of Pyloric Exclusion (Di un metodo costrittivo razionale di esclusione del piloro). *Gazz. d. osp. e d. clin., Milano*, 1917, xxxviii, 1075.

The author thinks that constricting methods of excluding the pylorus are preferable to ligature. The weak point in most ligature methods, demonstrated both experimentally and clinically, is the fact that there is a tendency to canalization and re-functioning of the pylorus.

The author thinks that satisfactory constriction would be obtained from the use of a rubber tape band. Calabrese some time ago made a pyloric exclusion in a dog by constricting the region of the antrum with a strong rubber band. The animal had had a contemporaneous gastro-enterostomy. It lived and was killed six months later. Examination showed that the pyloric closure was perfect in the strictured region and those signs of reaction observed when other materials were used

were not seen. The constricted point was observed as a projecting ring covered with newly formed connective tissue.

The author points out that rubber may remain for a long period in the human tissues without undergoing any alteration. He thinks it would be better to use tape than the rubber band used by Calabrese, as it would exert a more regular and uniform pressure on the parts. The tape is fixed at the selected point by Lembert sutures which assists in the connective tissue-forming activity about the rubber. The constriction should not be too severe.

The author thinks that Calabrese's experimental trial is sufficient to show that the method might be applied to the human subject. W. A. BRENNAN.

Pacini, A. J. P.: Blood in the Stools in Duodenal Ulcer. *Med. Rec.*, 1917, xvi, 942.

The author believes that when a suggestively characteristic history is obtained, the finding of occult blood in the stools warrants a confident diagnosis of duodenal ulcer. One must feel certain, however, of having excluded that arising from food, from hemorrhages in other parts of the gastrointestinal tract, from hemorrhoids, and, in the case of female parts, some blood occasionally present in vaginal discharges.

Adler's benzidin test has registered against it a few objections, but it embraces so many commendable features as to place it first in consideration, in the view of the author. In this test an alcohol and ether extract is a necessary requisite.

In a series of 32 cases of duodenal ulcer wherein the clinical diagnosis was rightly confirmed at operation, routine benzidin tests were positive in 26 and negative in 6 of the cases.

Common opinion based upon established laboratory investigations is that the benzidin is more delicate than the guaiac test. It was not possible to confirm this in the present short series studied. It is not denied, however, that in a watery solution of blood, benzidin will react in dilutions with which guaiac has failed. As a precaution against occasional error revealed by this finding, it appears advantageous to conduct both tests upon the same stool.

In conclusion the author makes the following suggestions: The blood in the faeces is a finding all-positive when extra-intestinal sources are absolutely eliminated in cases of duodenal ulcer. The examinations should include a guaiac test, the benzidin test, a spectroscopic search for haematin, and a microscopic search for haemin crystals.

E. C. ROBITSHEK.

Garrow, R. P.: Acute Torsion of the Whole Mesentery of the Small Intestine. *J. Roy. Army M. Corps*, Lond., 1917, xlix, 714.

A soldier while in the trenches was seized with abdominal pain, vomiting and diarrhoea. When examined in the hospital, he was pale, his pulse was 140, there was profuse perspiration, and the abdomen was soft but not distended. He was treated

as a case of dysentery. He died thirty-six hours after onset of the symptoms.

On autopsy acute torsion of the whole mesentery of the small intestine was found. With the exception of the duodenum, together with nine inches at the upper end of the jejunum and three inches at the lower end of the ileum, the entire length of the small intestine was of a deep plum color and dilated enough to fill the distended abdomen. The lumen was filled with ordinary intestinal contents and with much blood and gas. The surface was smooth and glistening. There was no peritonitis.

Behind the mass of dilated intestine could be felt a hard, rope-like structure about the thickness of the finger, stretched tightly over the bodies of the lumbar vertebrae from above downward to the right. This was found to be the mesentery of the small intestine twisted on itself from left to right. It required three and one-half turns to undo the twist. No apparent cause could be found for the condition. There was no sign of gangrene in the small intestine; the engorgement with blood was due to interference with the mesenteric circulation, complete arrest of the flow in both veins and arteries.

Weible of North Dakota in 1914 collected from the literature 66 cases of acute torsion of the mesentery; of these, 23 recovered after operation. In only 2 of these cases did the torsion amount to 720°, i.e., two complete turns. The case now reported therefore appears unique as regards the amount of the twist, i.e., 1260°. W. A. BRENNAN.

Quarella, B.: Retrograde Intestinal Gangrene with Particular Reference to the Pathogenesis (Contributo allo studio della gangrena intestinale retrograde con particolare riguardo alla patogenesi). *Riforma med.*, Napoli, 1917, xxiii, 330.

Quarella successfully operated upon a case of gangrene of the intestine and appendix due to strangulation in a scrotal hernia. The contents of the hernial sac were composed of the caecal ampulla, the base of the appendix, and about 35 cm. of the small intestine. The intestinal segments were in a good state of nutrition, but the appendix and intermediate tract of the small intestine, 50 cm. long, were in advanced necrosis. Resection of the appendix and of the loop of necrotic intestine, with end-to-end anastomosis, resulted in a prompt recovery.

Quarella also reports a second case in a man sixty years old who thirty years before had been operated upon for a bilateral scrotal hernia. The hernia recurred on the left side, but was easily reducible. Recently the occurrence of acute symptoms led to the operation now reported. The hernial sac was isolated after difficulty and found to contain three intestinal loops, two of them about 10 cm. long and the third about 20 cm. They were congested and slightly ecchymotic. Two intermediate loops were outside the sac, the upper partly ecchymotic but the lower loop markedly necrotic. The

involved intestine, measuring 98 cm., was resected and a lateral anastomosis done. The patient died in collapse the following day.

From 1880 to 1894, three cases of strangulation of the intermediate intestinal segment in a hernia were reported; but it was only in 1895 that Maydl introduced the term "retrograde strangulation" to indicate the phenomenon by which the strangulated part of the organ is found in the abdomen, while the remainder usually in normal condition is strangulated in a hernial sac.

Since then a fair number of cases have been reported in German and Slavic literature, but few in English, French, and Italian.

Retrograde strangulation has been observed in inguinal, crural, umbilical and other herniæ. It is most frequent in inguinal. In regard to sex and age, it occurs in about seven men to three women, and at the ages of forty to sixty years generally. There are usually two intestinal loops in the sac. The segment in the sac is usually of the small intestine and is from 60 to 70 cm. in length. Wendel collected 65 cases. In 12 cases in which the loops were only very slightly altered, the external loops were found intact in 4 cases, slightly altered in 3, and gangrenous in 5. In 26 cases in which the intermediate loop was moderately altered but not gangrenous, the external loops were intact in 15, slightly altered in 9, and necrotic in 2. In 27 cases in which the intermediate loop was necrotic, the external loops were normal in 8, slightly altered in 11, and gangrenous in 8.

Quarella reviews the literature at length with a view to discovering the pathogenesis of the condition, and summarizes the theories put forward by various authors. He has made animal experiments on guinea-pigs to determine the pathogenesis of retrograde intestinal gangrene. He arrives at the conclusion that the essential cause of this is the strong venous congestion, the hæmorrhagic extravasation, and the parietal and mesenteric thrombosis of the internal loop due to severe obstruction of its return circulation. Such difficulty in the circulation is favored by the anatomic disposition of the blood supply. The frequent integrity, relative or absolute, of the external loops when there are no unfavorable complications, may depend on the peculiar mode of the strangulation.

The prognosis of retrograde strangulation is generally more grave than that of ordinary strangulated hernia, and the mortality is accordingly very high. In unoperated cases a fatal issue is certain. In 36 operated cases in Wendel's collection the mortality was 75.6 per cent. In 24 of them in which the intestine was resected, the mortality was 62.5 per cent. Better results are obtained in cases operated upon early. In the cases which recovered, the time elapsing between strangulation and intervention was about twelve hours; and in the fatal cases about fifty-two hours. Palliative operations have in general been failures, and intestinal resection is always to be the choice if the

patient's condition permits it. The gangrenous condition may demand extensive intestinal resection. In 5 of the cases in which more than two metres of the intestine were resected, there were 3 recoveries.

W. A. BRENNAN.

Scott, J. R.: Tuberculosis of the Appendix. *Ann. Surg.*, Phila., 1917, lxiiv, 648.

Since the recognition of the disease by Corbin in 1873, tuberculosis of the appendix has attracted the attention of both the clinician and surgeon. However, there are but 44 articles to date upon the subject, 9 of which have been contributed by physicians of the United States.

The disease is found more often in males than in females, the ratio being as 3 to 2. Most of the cases reported have occurred in young adults.

The existence of primary tuberculosis of the appendix has been denied, but Beck reports the autopsy findings in a case in which there were no evidences of tuberculosis elsewhere. These cases are probably implantations favored by fecal stasis which often occurs in the appendix.

The secondary form is much more common. It may arise as a direct extension from tuberculous adnexa, or from ileocæcal tuberculosis, or by invasion through the blood stream from any remote focus, as the lungs.

The diagnosis is difficult, although about 0.5 per cent of appendices surgically removed are tuberculous. It rests upon the demonstration of an afternoon temperature, progressive loss of weight, evening sweats, and pain and tenderness in the right lower quadrant. The prognosis is unfavorable except in the very rare primary form. The treatment is operative whenever possible, although active pulmonary lesions contra-indicate operation.

Three forms are usually described, the miliary, the ulcerative and the hyperplastic. GATEWOOD.

Porter, L.: Appendicitis in Childhood; a Study of 100 Cases. *Calif. St. J. Med.*, 1918, xvi, 10.

The author in a study of 100 cases of appendicitis in childhood found that a large proportion of the children were in their third year; sex incidence was about equal. Pain referred to the right lower quadrant of the abdomen occurred in almost all cases. General abdominal pain occurred in 57 cases, sometimes preceding and sometimes following the pain referred to the right side. Pain also occurred in the epigastrium, bladder region, and right leg, accompanied by characteristic tenderness on moving the limb; vomiting was absent in 17 cases. Chills occurred in 15 cases.

The temperature ranged from normal to 104 degrees, the pulse from 80 to 160, the respirations from 22 to 70. Leucocytosis varied from 8,000 to 25,000. Differential count showed a polymorphonucleosis of from 45 to 90 per cent.

In 37 cases rupture of the appendix occurred before operation, 23 having general peritonitis;

recovery followed early and free drainage. In 60 cases, there was a history of previous attacks of tonsillitis. A rapid progress to gangrene and perforation is much more common before the fifth year than later in life; 73 per cent of patients five years old showed perforated appendices in contrast to 28 per cent between ten and fifteen years.

Diaphragmatic pleurisy is the only condition it may be really difficult to differentiate; other conditions, especially abdominal adenitis, may be confused with it. Parents should be taught to see a potential appendicitis in every case of abdominal pain.

H. H. FROMICH.

Arnold, I. A.: Suppurative Appendicitis. *Internat. J. Surg.*, 1917, xxx, 344.

The author has recently observed two cases where the pus burrowed downward into the pelvis, also upward behind the colon, pointing in the groin and over the crest of the ilium, rendering it difficult to determine whether there was a psoas, iliac or appendicular abscess.

The further the abscess from the median line, the more favorable the prognosis. The most important phase of the blood count is a relative increase in the polymuclear cells. With little or no leucocytosis, this is a positive indication of inflammation. The percentage of increase in polymuclear cells varies with the severity of the inflammation. If below seventy, neither pus nor gangrene is to be expected.

In connection with operative procedures, a few "don'ts" seem appropriate:

1. Don't get too close to the inner margin of the abscess.

2. Don't try to remove the appendix in all cases.

3. Don't irrigate.

4. Don't try to drain the pus cavity with gauze.

5. Don't keep the patient too long in bed.

It is believed that heretofore this class of patients has been kept too long in the recumbent position. While it would be difficult to state just what length of time they should remain in bed, as each individual case must be considered upon its merits, from six to ten days would seem quite long enough in the average case.

EDWARD L. CORNELL.

Walscheid, A. J.: Single Suture Appendicectomy. *N. Y. M. J.*, 1915, cxvii, 8.

The anatomy of the infundibulopelvic ligament in its appendicular relation indicates the removal of the appendix in all pelvic operations. By the selection of a technique calling for speed, simplicity, and gentle manipulation, the author believes the added risk of the operation to be less than the future risk of an attack of appendicitis, and avoids many of the factors that make a secondary operation difficult and dangerous.

On completion of the pelvic work the patient is first replaced in the horizontal posture. The tip of the appendix is picked up in a clamp. A long sixteen- or eighteen-inch suture is carried through the

clear triangular space at the base of the appendix and tied, thus ligating the appendicular artery. The mesentery is then cut free, leaving a small stump.

Continuous with the appendix, at its base, is the longitudinal stria of the cæcum. One-fourth of an inch from this base the needle is carried with a Lembert-Czerny stitch as a fixation suture to prevent the ligature from slipping. The needle is now carried back and inserted through the mesentery between the first ligature and the base of the appendix, and tied to the proximal end of the first knot. The appendix is clamped, cut, and the stump treated with carbolic acid and alcohol.

Anterior to the mesentery and upon the lower portion of the cæcum, running in the direction of the ilium, there is always a fascial fold called the fold of Treves. This fold is now picked up on the needle and carried over to the most dependent portion of the cæcum, where it is fixed with a Lembert-Czerny suture and tied. This covers the stump of the appendix and completes the operation, requiring in all five or six minutes' time.

The author cites one death due to intestinal obstruction from an acute gangrenous appendicitis, which came under his treatment suffering from appendicitis complicated with obstruction. A previous hysterectomy had been done. The author advises the removal of the appendix in every pelvic operation, and for speed, simplicity and prevention of shock has devised the single suture operation. He shows four illustrations of the operation.

Landaman, A. A.: The Diagnostic Significance of Bleeding from the Rectum. *Med. Rec.*, 1918, xciii, 63.

The author gives the various conditions which may cause bleeding from the rectum. These are classed as surgical or medical.

Surgical conditions may be divided into:

1. Local conditions not acutely surgical. They may include internal hæmorrhoids; ulcerations, either (a) simple, or (b) specific, as tuberculosis, syphilis, gonorrhœa, and dysentery; proctitis, proctocolitis, enterocolitis, simple and specific; tumors, both (a) benign, as fibromata, lipomata, etc., and (b) malignant, as carcinoma, papilloma, sarcoma, etc.; stricture, specific and non-specific; proidentia; fissure; cryptitis; helminthiasis; diverticula; gastric or duodenal ulcer; impaction; chronic constipation.

2. Local conditions acutely surgical. These include foreign bodies; volvulus; invagination; strangulated hernia; portal or mesenteric thrombosis; typhoid fever, appendicitis, rupture of an aneurism; postoperative bleeding following operations on the rectum and colon; abscesses.

Medical conditions may be divided into:

1. Mechanical causes, including (a) hepatic disease; (b) chronic nephritis; (c) cardiac decompensation; (d) arteriosclerosis and conditions accompanied by high blood-pressure.

2. Defective blood states: (a) hæmophilia; (b) purpura; (c) leukæmia; (d) pernicious anæmia; (e) scorbutus; (f) icterus.

3. Toxic conditions: (a) from without; i.e., poisoning by arsenic, mercury, phosphorus, sulphurated hydrogen, nitrobenzene, etc.; (b) from within; i.e., scarlet fever, yellow fever, cholera, malaria, septicæmia, pyæmia.

A very careful history should be taken of every patient; particular emphasis should be placed on the age, occupation, past or present illnesses or operations, habits, presence or absence of protrusions or pain, and any loss of weight. One should determine the character of the bleeding, the length of time it has lasted, its relation to defecation, the relative quantity lost, whether expelled pure or mixed with pathological discharges, together with a very complete physical examination of the patient.

There is but little direct connection between loss of weight and loss of blood, but there is a very close relation between loss of weight and the cause of the loss of blood. There is a great loss of weight in carcinoma, multiple polyposis, chronic enteroproctitis or coloproctitis, even with little bleeding; small loss of weight in piles, polypi and non-malignant tumors, even with considerable bleeding. It must be remembered that malignant growths may be engrafted on benign ones. C. A. BOWERS.

Davis, C. B.: *Cancer of the Rectum. Surg. Clin. Chicago*, 1917, 1, 1221.

The choice of operation depends on the site of the growth. If the disease is limited to the anal epithelium, it is not necessary to remove the ampulla or the glands behind the ampulla. The operative technique for cancer of the rectum is given as follows:

Through an incision in the perineum a ligature is carried around the bowel above the level of the anal canal. The sphincters are incised anteriorly and posteriorly and segments are turned aside. The ampulla is resected and the bowel is brought down and attached to the anal sphincters.

Various methods of termination of the operation are employed after removal of the tumor mass. The anus may be reconstructed, or a sacral or abdominal anus may be formed. Where an abdominal anus is formed, by leaving the ampulla as a blind pouch, mortality and shock are lessened.

Tumors at the rectosigmoidal junction may be treated by removal and end-to-end anastomosis or abdominal termination of the bowel. End-to-end anastomosis carries a high mortality and frequently results in faecal fistule.

In all cases of cancer of the rectum it is well to open the abdomen to determine operability. Malignant involvement of the glands of the mesorectum or of the uterus or vaginal wall is no contra-indication to operation. Involvement of the liver, prostate or sacrum contra-indicates operation. The immediate mortality in posterior route operations is lower than in the combined method, but a larger

number of ultimate cures result from the combined abdominal and perineal operation.

In constructing an abdominal anus, by carrying the gut upward under the skin before anchoring, a better functioning anus is obtained.

Many cases of cancer of the rectum are diagnosed as hæmorrhoids. Digital or proctoscopic examination establishes the diagnosis. I. E. BISHKOW.

Ochaner, A. J.: *Carcinoma of the Rectum; Excision; Transplantation of the Sigmoid into the Perineum; Technique of Operation. Surg. Clin. Chicago*, 1917, 1, 1713.

The patient was fifty-three years old. Passage of blood and mucus per rectum with some tenesmus for the preceding six weeks were the only symptoms. Examination showed that 4 cm. above the internal sphincter there was a hard cauliflower-like mass encircling the lumen of the bowel. A diagnosis of carcinoma of the rectum was made.

A colostomy opening was made by cutting the skin, superficial fascia and splitting the external and internal oblique in the direction of their fibers. The descending colon was drawn through and anchored by passing a strip of gauze under the loop of bowel. Through a median incision the bowel was grasped transversely with two heavy clamps 5 cm. above the mass and cut. The lower segment with the peritoneum and fat was dissected down to the rectum.

The patient was now placed in a lithotomy position and an incision made encircling the anus. The levator ani was severed on each side and the tissues dissected upward with the finger. All bleeding points were ligated step by step. The mass was removed and the bowel brought down and sutured into the middle of the perineum. Lateral cigarette drains were inserted.

A precaution in after-treatment is not to permit the patient to lie on his back. The bed is elevated and the patient kept on one side or the other.

A glass tube is substituted for the gauze to anchor the colon in a colostomy incision, and a colostomy opening made in forty-eight hours if necessary. This protects the operative field from contamination until healing is complete. I. E. BISHKOW.

Landsman, A. A.: *Operative Methods for the Cure of Hæmorrhoids. N. Y. M. J.*, 1918, cvii, 59.

Divulsion of the sphincter is indicated in cases of general engorgement and congestion, in the case of a small tightly contracted anus, in hypertrophy of the levator ani and the sphincter ani. Divulsion means the stretching of the sphincter until the fibers have lost their tonicity, but not a tearing of the fibers. Neurological examination for tabes should be made in all cases before operation to avoid cases of incontinence.

Injection with various solutions is not safe or effective. Cases of sloughing and gangrene may occur. The application of caustics is condemned.

Crushing operations and excision without suture

may result in secondary hemorrhage. The clamp and cautery operation is not used as extensively as formerly because of the occurrence of secondary hemorrhage.

The ligature operation is the one of choice. The Whitehead operation, i.e., total removal of the hemorrhoid-bearing field, is frequently followed by stricture. Infection is also more liable to occur.

The electric cautery is applicable in small hemorrhoids.

The complications occurring in hemorrhoid operations are: infection, secondary hemorrhage, excessive postoperative pain, disturbed bladder function and spasm of the levator ani muscle.

I. E. BISHKOW.

LIVER, PANCREAS AND SPLEEN

Griffith, J. P. C.: Primary Carcinoma of the Liver in Infancy and Childhood. *Am. J. M. Sc.*, 1918, clv, 79.

The patient, aged 21 months, had a negative history. Previous health was good, except for some degree of anemia, supposed to be dependent upon indigestion, and a constant tendency to constipation. The winter previous her appetite had been abnormally great, although she would take little other than milk, and for some time she had had attacks of vomiting nearly every morning. This condition had improved. Five weeks before the child was seen, her father accidentally discovered a lump which could be felt beneath the costal margin on the right side in front.

Examination showed a well nourished infant, with a slightly pale skin. Just below the costal border, midway between the midsternal and the right mammillary lines, was a visible prominence which on palpation was found to be a hard, smooth mass, apparently with a rather firm edge. It appeared to be connected with the liver. Bimanual palpation in the renal region produced no movement of the mass. It changed position with respiration. The whole liver was decidedly enlarged, and its edge could be felt as far as the left mammillary line at the costal border.

At operation the right lobe of the liver came well into view, and situated in its substance was a dark-gray, glistening, fibrous capsule covering a mass the size of a large orange, which projected slightly above the surface of the organ and extended in depth through the entire thickness of the lobe, becoming visible upon the under surface when the liver was lifted. There was no evidence of infiltration of the hepatic tissue beyond the capsule of the growth or of involvement of any organs as far as could be seen. No adhesions were present. Incision through the capsule showed a soft, whitish substance, much resembling in color and appearance the tissue of the thymus gland or pancreas. Inasmuch as the case appeared to be an inoperable one, the wound was closed.

The growth histologically was a carcinoma simplex, but at one or two points there were attempts

at tube arrangement of such a character that the growth originally may have been a cancer of the bile-ducts.

The mass continued to grow in a downward and forward direction and later toward the left hypochondrium, the abdomen finally becoming distended by it. At times the increase of size would appear to be rapid and then would follow periods of quiescence. As time passed, the superficial veins grew more prominent, until finally the larger were about the size of a lead pencil. The tissue about the navel became discolored and very thin. No ascites or edema were present. There was sleeplessness and increasing debility, but apparently little pain. Death occurred a few months later.

EDWARD L. CORNELL.

Fowler, W. F.: Stricture of the Gall-Bladder. *Ann. Surg.*, Phila., 1917, lvi, 679.

The author reports a case of stricture of the gall-bladder characterized by striking symmetry of the two portions. He gives the name "dumb-bell gall-bladder" to this particular variety. He considers it undoubtedly a case of cholecystitis chronica cystica.

Strictures of the gall-bladder may be divided into (1) the congenital, and (2) the acquired. Else classifies the congenital types as (a) annular, (b) those in which the folds of the inner layers occlude the lumen partially, and (c) those in which the fundus is folded upon the body of the gall-bladder. The last mentioned is the most usual type.

The acquired strictures may arise from destructive lesions beginning in the mucosa and causing any degree of constriction from a very slight narrowing to a complete obliteration of the lumen of the connecting strait. Acquired strictures may also arise from intramural infections, pathological processes beginning in the serosa, and from adhesions existing between the gall-bladder and other organs or the abdominal wall. Other causes are perforating wounds and malignancy.

The author's case gave a definite history of appendicitis and the diagnosis was not made prior to exploration. The gall-bladder contained no bile, but merely a few drops of white cystic fluid and two marble-sized round stones.

GATEWOOD.

Martin, H. H.: Gall-Bladder Surgery. *J. Indiana St. M. Ass.*, 1917, x, 463.

This article is historical in nature and the author follows in a clear-cut manner the advancement of gall-bladder surgery.

The teachings of Galen were accepted until the beginning of the seventeenth century. He held that the liver was the seat of the mind, that it made the blood, and that the veins had their origin in it. After Harvey's discovery of the circulation in 1616, Tælli's discovery of the thoracic duct in 1622, and Perquet's discovery of the lacteal vessels in 1674, the theories of Galen were attacked and to a certain degree overthrown.

The first successful removal of gall-stones was noted in 1622 and the first successful cholecystectomy was done on a dog in 1630. The author's conclusions that the common duct dilates after the removal of the gall-bladder has been verified by Judd and Mann.

From 1687 to 1742, as a result of injury to the abdominal wall, involving the gall-bladder, gall-stones were removed three times. In 1742 Petit devised an operation to remove stones in a distended gall-bladder, which he determined was adherent to the abdominal wall. In 1774 Block thought that the adhesions to the wall were necessary, and in these cases applied caustic potash over the gall bladder, and after the tissues were destroyed down to the gall-bladder he opened it.

In 1867 Bobbs of Indianapolis made the first successful cholecystostomy. In 1878 Kocher did a two-stage operation of draining the gall-bladder. It was not until 1882, after Langenbach did a successful cholecystectomy, that gall-bladder surgery received much attention. In 1888 Bevin published an extensive review of the anatomy of the gall-bladder region. In 1900 Summers advocated inverting the cut edges of the gall-bladder about the drainage tube and stitching the gall-bladder peritoneum to the parietal peritoneum.

In 1900 W. J. Mayo advocated the removing of the mucous membrane of the gall-bladder where the pathology is extensive. Loekker stated that the gall-bladder should be treated as the appendix and removed if there was acute or chronic inflammation. Means of Cleveland, Richardson and Marcy of Boston, and Deaver of Philadelphia, advocated early operation, while Senn was in favor of operating only to save life.

In 1901 Halsted announced that he could produce pancreatitis by forcing bile directly into the pancreatic duct.

Through Rosenow's work it has been learned that the infection is not alone in the bile, but the tissues of the gall-bladder as well.

In 1916 Deaver announced that 65 per cent of his failures were due to the non-removal of the gall-bladder. Mayo stated that cures following cholecystostomy were 53 per cent, that of cholecystectomy formed 71 per cent.

C. A. BOWERS.

Torrance, G.: Cholecystectomy; with a Report of 65 Cases Operated upon for Gall-Bladder Disease. *Am. J. Surg.*, 1917, xxii, 323.

The author reports operations upon 65 cases of gall-bladder disease, in 20 cases of which the gall-bladder was removed and in one case a cholecystenterostomy was done for persistent fistula of two years' duration. Seven cases had been drained previously. There were 17 males and 48 females.

In animals which have no gall-bladder there is found a large common duct. Judd and Mann in experiments found that the ducts usually became dilated within sixty days after removal of the gall-bladder. All of the ducts were dilated except those

in the liver itself. For a time the pressure in the ducts is increased until the muscle of Oddi is overcome and then the bile flows continuously. When this muscle is dissected out at the time of operation, there is no dilatation of the ducts.

Meltzer considers the muscle fibers of the gall-bladder and those of the papilla as antagonistic. The vagus seems to contain motor fibers for the sphincter of the common duct and inhibitory nerve-fibers for the gall-bladder.

That the gall-bladder is used as a reservoir is questioned by many. The most common theory is that the gall-bladder contracts rhythmically eight to ten times per minute and overcoming the sphincter of Oddi forces the bile into the duodenum.

Mayo-Robson lays stress on the importance of always preserving the gall-bladder where there is any disease of the pancreas.

Rosenow has shown that infection is brought to the gall-bladder through the blood stream; the bacteria become lodged in the capillaries of the wall of the gall-bladder and infarcts cause stasis, infiltration, and thickening of the mucous membrane, with necrosis.

Gall-stones are rarely ever found in the very acute and severe infections of the gall-bladder, but are the result of a previous mild infection. Seventy-five per cent of gall-stones are found in women, and in 80 per cent of these the symptoms develop during pregnancy.

Bevan says cholecystectomy is done in about 90 per cent of cases, cholecystostomy being reserved for simple cases with little gall-bladder change and no cystic duct stones.

Lund advises removing the acutely inflamed and especially the gangrenous gall-bladder, and those where there is an acute perforation.

C. A. BOWERS.

Mason, J. T.: A Pancreatic Cyst; Removal of Three-Fourths of the Pancreas; Recovery. *Northwest Med.*, 1918, xvii, 24.

The author's patient was a married woman, aged twenty-four, who complained of cramp-like pains all over the abdomen, pain radiating to the left shoulder, frequent vomiting, and constipation. Physical examination revealed in the lower epigastric and upper umbilical regions a tumor which was very tender and immovable. Previous to operation this mass enlarged very rapidly, and at the time of operation it was about the size of a baby's head. The patient had relief from pain only by lying on her left side, with her knee as near her chin as possible.

Operation through a right rectus incision revealed the stomach, gastrocolic omentum and transverse colon flattened out over the mass and adherent to it. The tissues were all edematous, even the parietal peritoneum. The approach was made through the mesocolon and the cyst was tapped, removing four quarts of viscid fluid.

With the exception of the head, the entire pan-

creas was lying in this cyst, it was gelatinous in appearance and past all possibility of restoration. By loosening the pancreas from behind, two chronic catgut sutures were slipped around it, one at the tail, the other at the neck, and about three-quarters of the pancreas was removed. The drainage tube was left by making three different purse-string sutures, one above another, and then the fat of the omentum was tucked around this.

The tube continued to drain for forty-three days, nine and one-half ounces being the largest amount received from the tube and one and one-half the smallest in any twenty-four hours. The patient left the hospital on the fortieth day, practically well.

P. G. SKILLERN, JR.

Kennedy, J., and Burge, W. E.: The Effect of Pancreatectomy on the Catalase Content of the Tissues. *Arch. Int. Med.*, 1917, xx, 892.

The authors mention the older workers who recognized the coincidence of diabetic symptoms and lesions of the pancreas, but the literature on the subject is so enormous that no attempt was made to review it.

The present investigation was begun in an attempt to find an explanation for the defective or imperfect oxidation in diabetes. The authors found that the amount of oxidation in the different muscles was directly proportional to the amount of catalase; that by increasing or decreasing the amount of work, and hence oxidation in a muscle, there was a corresponding increase or decrease in the catalase content. Since in all the instances cited by them where oxidation was increased or decreased, or rendered defective, there was a corresponding increase or decrease in catalase, the conclusion was drawn that there exists a very close relationship between catalase content and amount of oxidation.

The animals used in the investigation were dogs. Several of these animals were depancreatized. Examination of the urine on the first day after the operation showed the presence of sugar in all the depancreatized animals. The longest time any animal was permitted to live after the operation was 13 days, while the shortest was 6 days. Those that had lived 13 days were in very bad condition and showed large amounts of sugar in the urine. After the animals were etherized their blood-vessels were washed with large quantities of 0.9 per cent sodium chloride until free of blood, as was indicated by the fact that the wash water gave no test for catalase. The bloodless liver and heart were then removed and ground up separately in a hashing machine.

The results of the determinations are given by the authors in a table of catalase determinations in normal and diabetic liver and heart, and by comparing the data it can be seen that the catalase content of the livers of the diabetic animals was decreased 72 per cent and that the catalase content of the heart was decreased 48 per cent over that of normal animals.

The authors found that the catalase of the tissues of depancreatized dogs decreased during the first five or six days, at which time a certain low level was reached and maintained, and they also present evidence showing that catalase is formed in the liver, and that this is normally given off to the blood as a result of stimuli received over the splanchnics.

The authors summarize their results as follows: Extirpation of the pancreas decreased the catalase content of the liver by about 75 per cent, which resulted in the decreased output of catalase into the blood and hence a lessened supply to the tissues. The decreased catalase content of the tissues may account for the imperfect or defective oxidation in diabetes, since the amount and intensity of oxidation is so inseparably linked with catalase.

GEORGE E. BILBY.

Burket, W. C.: Changes in the Peripheral Blood Consequent upon the Diversion of the Splenic Blood into the General Circulation. *J. Exp. Med.*, 1917, xxvi, 849.

A review of the literature revealed the fact that numerous investigators had attempted to discover the function of the spleen by means of a study of the splenic circulation itself, and Burket draws attention to Eck's method of diverting the portal and splenic blood into the general circulation and the various theories advanced by other investigators in regard to the function of the spleen that were based upon the distribution of the splenic circulation as determined by anatomical dissection in animals and in human cases. His search of the literature, however, revealed only one instance in which a study was given of the peripheral circulation after the splenic blood alone had been diverted into the general circulation. On account of the fact that diversion of the portal blood into the inferior vena cava blood from all the tributaries of the portal vein was included, it seemed to Burket advisable to make a thorough and careful study after the splenic blood alone had been thrown into the general circulation. He reports upon a series of experiments because of the rather uniform results obtained in the five large dogs that were studied, and the simple method that was used to divert the splenic blood into the general circulation.

The method employed consisted in the study of the five dogs over a sufficiently long period before operation in order to establish accurate controls for each dog; and after the splenic blood had been diverted into the general circulation, this study was repeated over a period varying from one to four months' duration in the different animals. In addition, two weeks before the end of the experiment the dogs were vitally stained to a maximum with trypan blue, and finally they were killed in order to determine the gross and histologic findings.

At the time of operation, with the animals under ether anesthesia, the spleen was first measured through a left rectus incision and a small histologic control section removed. After the splenic and the

left renal vein had been divided between double ligatures, a lateral anastomosis was made between the renal and splenic veins, using fine beaded black silk, oil technique, and a Peet three-bladed, spring-jawed blood-vessel clamp; and lastly, all possible collateral circulation with the spleen was divided, especially the communicating branches between the spleen and the stomach. The animals recovered rapidly from operation and the wounds healed by first intention in every case. The dogs kept in splendid general condition throughout the experiment and several of them were operated upon a second and a third time in order to verify intra-abdominal conditions, with the result that no collateral circulation and no intra-abdominal adhesions were found, and the anastomosis was working.

In a series of tables and charts the author gives in great detail the results of his observations, and from his experiments he draws the following summary:

The principal change in the peripheral blood consisted in the prolonged increase in number of the transitional white blood-cells, an active brief stimulation of the polymorphonuclear neutrophiles, which were later relatively decreased in number in four cases, in three dogs a late rise in number of the mononuclear and eosinophilous cells, and in one dog of mononuclear cells alone.

The normally high differential percentage count of polymorphonuclear eosinophiles in dogs would be expected on account of the numerous parasitic infections which they usually have.

The splenorenal venous anastomosis offered a simple and satisfactory method of diverting the splenic blood into the general circulation because it was easy and produced no gross abnormal intra-abdominal changes, and the vessels normally lay parallel to each other and were readily approximated without tension.

The operation was successful in every case; the animals did very well after operation and were healthy and active. No noteworthy histologic changes were observed in any of the organs or tissues. There was no essential change in bile production that could be detected by jaundice. The urine and stools showed no changes.

GEORGE E. BEILBY.

Norris, C., Symmers, D., and Shapiro, L.: Banti's Disease. *Am. J. M. Sc.*, 1917, cliv, 893.

The authors state that Banti's disease as an entity has no legitimate claim to recognition and that the term long covered a conglomeration of conditions which are gradually being recognized. By an extensive study of abundant anatomical material the authors conclude that syphilis adequately fulfills all the requirements enumerated by Banti.

Their conclusions follow:

1. The so-called Banti's disease is neither an independent clinical nor anatomical entity, and the designation should be eliminated from the nomenclature of splenic pathology, since it not only

carries with it the objections customarily urged against the surnamed diseases, but is in reality a manifestation of visceral syphilis. This conclusion is based on the following facts:

(a) The later stages of acquired syphilis are occasionally attended by enlargement of the spleen arising absolutely independently of cirrhotic changes in the liver, and, when combined with the secondary anæmia so constantly to be observed in the syphilitic, it fulfills the essential requirements of the first, or pre-ascitic stage of Banti's disease as originally postulated.

(b) In other cases of late acquired syphilis splenomegaly and cirrhosis of the liver are combined, in which event jaundice, subcutaneous and submucous varices, ascites, digestive disturbances dependent upon chronic passive congestion of the gastrointestinal mucous membrane, hæmatemesis, and related changes constitute an exact clinical counterpart of the picture given by Banti for the intermediary and final stages of the disease described by him.

(c) The syphilitic cirrhosis of the liver just referred to is of two varieties, one corresponding to the atrophic or hob-nail liver of Laennec, in which syphilis is an etiological factor in at least one-third of all cases; the other, the coarsely lobulated liver in which syphilis is universally recognized as the specific cause.

(d) In 4,880 autopsies at Bellevue Hospital cirrhosis of the liver occurred 74 times in 314 luetic subjects, or in 23.4 per cent, and of this number there was an associated splenomegaly of marked proportions in 48, or 64.8 per cent. Of the 74 cases, 50 were of the coarsely lobulated type and 24 of the atrophic or hob-nail variety.

2. The histological changes in the spleen in the condition described by Banti are identical with those due to syphilis. The lesion is a chronic diffuse interstitial splenitis attended, in certain instances, by sclerosis of the malpighian follicles. Banti and his followers attach great significance to the latter finding. As a matter of fact, sclerosis of the malpighian follicles is characteristic only of recessive status lymphaticus, in which it occurs with almost unfailing regularity, and in the spleen of the so-called Banti's disease it is but a coincident histological change.

K. L. VEHE.

Fottner, G. R., and Archibald, R. G.: A Case of Splenomegaly Treated by Splenectomy, with Report on Condition of the Blood and Spleen. *Lancet*, Lond., 1918, cxciv, 101.

In a girl of fourteen splenomegaly associated with hepatic enlargement and leucopenia and intermittent fever was treated by splenectomy. No cause for the splenomegaly was found. Six months after the operation the patient had gained in weight and strength and the leucopenia was less marked.

The author considers this a case of splenic anæmia allied to Banti's disease.

LISTER TUBOISKE.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES,
TENDONS, CONDITIONS COMMONLY
FOUND IN THE EXTREMITIES

Kreuscher, P. H.: Hypertrophic Villous Synovitis of the Knee-Joint. *Surg. Clin. Chicago*, 1917, 1, 1291.

This condition is frequently mistaken for tuberculosis and treated as such. The condition results from an infective process elsewhere in the body. It begins as an acute synovitis which becomes chronic with or without enlargement of the joint. A late picture of the disease shows marked enlargement of the joint with large masses protruding from either side of the patella and the quadriceps tendon and a rather less prominent patella.

Pathologic changes in these cases is the overgrowth of the synovial membrane and synovial fringe. This results from irritation of the invading organism and the repeated traumatism when the limb is in active use. On opening the joint, masses of hypertrophic villous tissue are seen; partial destruction of the cartilage, crucial ligaments and synovial membrane may be observed, but no destruction of bone.

The symptoms are less severe than one would expect. Frequently only a dull pain is present, or a feeling of stiffness in the joint. Sharp pain may be experienced after long continued traumatization.

In diagnosis, this condition must be differentiated from chronic synovitis, rheumatoid arthritis, Charcot's joint, tuberculosis and sarcoma. The cardinal signs are gradual enlargement of the joint; absence of the severe pain which one would expect in such an enlarged joint; oval boggy masses at each side of the patella; absence of patellar ballotement; no fluid on aspiration. The X-ray shows no destruction of bone.

Treatment should provide removal of the primary focus of infection, if possible; absolute rest of the limb by Buck's extension; autogenous vaccine; formalin and glycerine injections into the knee-joint. In an advanced stage, the only course is complete synovial capsulectomy. Kreuscher reports three such cases with operation.

I. E. BISHKOW.

Moynihan, B.: Wounds of the Knee-Joint. *Boston M. & S. J.*, 1917, cxxvii, 717.

There is no department of surgery in which greater changes have occurred than in that concerned with the treatment of wounds of the knee-joint. For academic purposes the following classes of injury will be recognized.

1. Cases of clean perforating wounds of the knee-joint by a rifle bullet. They are rapidly sealed and present no evidences of inflammatory reaction.

2. Cases of penetrating or perforating wounds of the joint with a large aperture of entry, or of exit, or both, when the projectile or part of it is retained in

the joint. All such cases must be operated upon and an X-ray examination is indispensable.

3. Cases of perforating or penetrating wounds of the joint with intra-articular fracture. This condition is a degree more serious than that in which the missile has become embedded in the end of the tibia or femur, and must be dealt with by adequate exposure and radical removal of all dead or severely damaged tissue.

4. Cases of injury to the knee-joint with extensive fracture of the articular ends.

In all cases the limb should be immobilized upon a splint at the earliest possible moment and kept so until a complete operation can be performed. The essential features in all operations are the excision of the wounds and the track of the projectile after preliminary sterilization by cautery or otherwise; and free exposure of the joint either by enlarging existing incisions or by long internal or external incisions, or by the formation of a flap by division of the patellar ligament. It is very important that all foreign bodies be removed.

The wounds are closed in layers by catgut sutures and drainage is secured by leaving a gap in the line of suture of the synovial membrane or by leaving a tube close down to but not into the joint. In severe staphylococcus or especially streptococcus infections of the joint, the wounds must be re-opened and the synovial membrane stitched to the skin, free drainage of the joint secured, and some method of progressive sterilization adopted. Excision may be necessary in this type of case. It should be immediately done in cases of severe comminution of the articular ends with much loss of substance.

If the infection is severe in an extensive wound, the method of resection with wide, temporary separation of the ends of the bones should be done. Amputation is desirable in cases of extensive damage, especially with much infection.

GATEWOOD.

Nové-Jossierand, G.: Orthopedic and Functional Results of Conservative Operations in War Wounds of the Knee (*Résultats orthopédiques et fonctionnels des opérations conservatrices du genou en chirurgie de guerre*). *Rev. d'orthop., Par.*, 1918, vi, 25.

The author operated upon 107 knee wounds; these included 26 lesions of the patella, 31 arthrotomies, and 50 resections.

Among the patellar lesions are included those cases in which the wound had attacked the anterior face of the knee, or in which the principal surgical intervention was removal of the patella. In the 26 cases the results show 5 cases of complete ankylosis, accentuated stiffness of the knee with poor movement in 9 cases; preservation of complete or very extensive movements in 12.

In the 31 arthrotomies which were done for deeper lesions or when they extended to all the cavities of the knee-joint, results showed complete ankylosis in 13 cases; incomplete ankylosis in 13 cases; preservation of movements above ten degrees in 6 cases. The author does not find that early intervention gives absolute assurance against ankylosis; it depends rather on the extent of infection at the time of operation.

In 50 resections the results were complete ankylosis in 27 cases; incomplete ankylosis in 15 cases; poor articulation in 8. In the great majority of cases of ankylosis the shortening has been moderate and permitted easy correction.

Certain cases which the author reports in detail show that non-consolidation appears due to the interposition of a thick layer of fibrous tissue between the bone surfaces. It is probable that the development of tissue in this part is due to defective coaptation. After resection the weight of the lower part of the limb has a natural tendency to separate the articular surfaces from each other; and the sutures made in the friable spongy tissue cannot always prevent this. Hence the author suggests maintaining the limb in a vertical position so that its weight would favor coaptation.

In summing up his results the author says that it is a generally accepted idea that the recovery of a movable and easily functioning joint consecutive to knee wounds is exceptional. In the great majority of cases, however, the amount of mobility preserved is rather a disadvantage because it diminishes the solidity of the limb and interferes with walking, without being sufficient to obviate the functional and social inconvenience of stiff knee. Consequently the return of motility should not be considered desirable when the lesion is not very severe. In many cases ankylosis is preferable and the more complete it is, the better is the function.

When mobility of the knee is especially necessary, it can be effected by a special operation which offers a better chance of success if done late when the traumatized area is less liable to infection.

W. A. BRENNAN.

Eisendrath, D. N.: Gunshot Wounds of the Femur. *Surg. Clin. Chicago*, 1917, 1, 1309.

Eisendrath reports two cases of gunshot wound of the femur.

The first case was a compound comminuted fracture of the lower end of the femur involving the knee-joint. A lower fragment was wedged between two upper fragments. Following the experience of others in European military hospitals, this case was treated conservatively by immobilization and extension in a Groves wire cradle leg splint with twenty pounds extension. Fifteen hundred units of antitetanic serum were given as a prophylactic measure. The result was good.

The second case was a similar fracture, but the patient was in delirium tremens so that treatment

could not be carried out. The result was malunion, with overriding and angularity, which will necessitate operative correction.

I. E. BISHKOW.

Taylor, R. T.: The Maryland Epidemic of Infantile Paralysis in 1916. *Am. J. Orthop. Surg.*, 1917, xv, 739.

The report of the State Board of Health of Maryland showed 353 cases of infantile paralysis in 1916. The city of Baltimore had 206 cases. A monthly incidence showed the disease to be prevalent in August, September, October and November. The fatality was 33.3 per cent. Fifty cases were autopsied, showing edematous cords and involvement of the lymphatics of the intestine and the adjacent mesentery. The ages of these cases ranged from birth to twenty-five years, the majority being about five years old. There were 289 whites and 64 negroes, 189 males and 159 females.

At the Kernan Hospital 48 cases were admitted, with 1 death due to inspiratory failure, a mortality of 2 per cent.

H. W. MEYERDING.

Bayksen: Gangrene of the Limbs. *Muenchen. med. Wchnschr.*, 1917, xliii, No. 19.

Bayksen of the Rostock Clinic relates two cases in which after trauma of the limb vessels gangrene occurred due to vascular occlusion. In both cases the injury was beyond the vessels, which were in no way cut. There was no infection. Nevertheless stricture of the vessels occurred as if they had been too long compressed by a hemostatic band.

In the first case a man received a gunshot in the vicinity of the popliteal artery. In a short time the symptoms of dry gangrene appeared. Operation showed the artery occluded by a thrombus about 6 cm. above the wound canal. Lexer some time ago demonstrated that at a distance from an injury caused by a projectile, lesions could occur in vessels which were not themselves injured. Lacerations of the intima and media may follow hyperdistension, and from this may occur the formation of aneurisms or thromboses. This appears to have been the mechanism in the case of Bayksen.

The mechanism in the second case was quite different. This was an explosion injury with multiple fractures and wounds of the soft parts and numerous hemorrhages into the vascular sheaths. On the third day after injury while the course of the wound was regular, the arm became cold and mobility ceased. Operation in this case showed all the vessels preserved in their continuity even where the tissues were most destroyed; but they were strictured to about one-third of their normal caliber and completely anemic. No thrombi were found. Microscopic examination of the vessels showed only numerous hemorrhages into the vascular sheath. The author thinks that an abnormal vascular spasm caused the death of the limb and that the angiospastic disturbances were due to the explosion lesions.

Little is known of the action of mechanical shock

on the state of contraction of the vessels. Deutscherlander observed a similar angioneurotic gangrene following a trauma, the opposite of spontaneous gangrene. After an injury of the soft parts of the fingers he saw phalangeal necrosis.

W. A. BRENNAN.

FRACTURES AND DISLOCATIONS

Hawkes, C. E.: Broken Neck. *Internal J. Surg.*, 1918, XXVI, 5.

The author shows that, due to its anatomical peculiarities and to its protected position, the spine is rarely fractured. Fracture of the spine comprises less than one-half per cent of all fractures. He reports one case of fracture of the sixth cervical vertebra with slight cord injury. Complete recovery resulted under extension and a plaster jacket which fixed the neck and supported the head.

Ninety-one cases of spine fracture from Rhode Island Hospital records are reported. Among these, sixty-eight per cent died at the hospital.

There were 35 neck fractures with 77 per cent mortality; 44 of the dorsal spine with 68 per cent mortality; 13 fractures in the lumbar region with a mortality of 34 per cent.

Of the 29 survivors, 21 were crippled to a greater or less degree.

The cases that were operated upon show slightly less favorable results than those treated otherwise, and the author cautions against operating unless the X-ray shows a positive indication which cannot otherwise be removed.

The X-ray is of great value in diagnosis especially in cases presenting abdominal symptoms, helping to differentiate from visceral injuries.

In regard to prognosis, nearly all cases with complete paralysis of motion and sensation below the injury, with loss of sphincter control, died; those recovering sensation and motion in a short time were greatly crippled if they lived. None of those cured had complete paralysis more than a few hours, possibly due to concussion.

H. J. VAN DEN BERG.

Ashhurst, A. P. C.: Birth Injuries of the Shoulder. *Ann. Surg.*, Phila., 1918, LXVII, 25.

From a careful study of about forty cases of birth injuries of the shoulder the author arrives at the following conclusions in regard to the pathogenesis of these conditions. "First, that pure nerve lesions occur and may be of much greater importance than any injury of the shoulder-joint, even if this is present; and secondly, that posterior subluxation of the humerus is a frequent lesion often overlooked, and perhaps may be the cause of persistence of paralysis." He considers it not improbable that the nerve lesions in the majority of these cases are terminal and not radicular, and supports this by pointing out that all of the muscles most constantly paralyzed are supplied by nerves which pass very close to the shoulder-joint and are therefore liable

to injury, while the muscles which habitually escape paralysis are supplied by nerves which at no part of their course come in close contact with the shoulder-joint or the bones which compose it.

As regards treatment, the author rejects nerve operations in early infancy. His treatment of shoulder injuries where no dislocation is present consists in keeping the hand and arm in front of the body and as soon as the soreness permits, the institution of massage and passive motion. Where dislocation is present, it is advisable to anesthetize the child at about the age of six months and reduce the dislocation bloodlessly. This may be done by placing the baby prone upon the table with the affected arm hanging over the side, gently rotating the humerus outward by means of the flexed forearm until the latter has been brought into the coronal plane of the patient's body and then applying downward pressure on the head of the humerus. Abduction of the shoulder-joint is then secured by laying the flexed elbow and the child's chest flat on the table and applying intermittent pressure to the posterior part of the shoulder while the elbow is raised by placing folded towels under it. This is continued until the elbow lies well posterior to the frontal plane of the body. The entire upper extremity and chest are then encased in plaster-of-Paris to maintain this position. After six weeks the cast is renewed and again allowed to remain for six weeks.

In patients over four years of age, the open method of reduction is preferable. An incision is made around the acromion which is then osteotomized and turned forward. The insertion of the subscapularis is divided while an assistant endeavors to rotate the arm outward. This makes reduction possible without difficulty. The tendons of the supraspinatus and infraspinatus and teres minor are shortened, the acromion replaced and fixed by sutures in the young or by screws in older patients. Skin closure is made without drainage. A cast is applied, as in the very young, for a total of twelve weeks with one change. After removal of the dressings, active and passive movements are employed. The author has employed this operation in five cases with no recurrences and marked improvement in all.

In older patients where no dislocation is present but marked contractures, it is better to resort to an open operation than to employ a prolonged course of passive movement and gymnastics.

GATEWOOD.

Henderson, M. S.: Recurrent or Habitual Dislocation of the Shoulder. *J. Am. M. Ass.*, 1918, LXX, 1.

Henderson states that dislocations occur more frequently in the shoulder-joint than in any other joint in the body, and that the ease with which reduction is accomplished is proportionate to the length of time the dislocation has been present. If the dislocation is associated with a fracture of the surgical neck of the humerus, unless reduction is

accomplished by an open operation, a resection of the head of the bone is usually necessary later.

Habitual dislocations of the shoulder-joint occur in cases in which reduction has been accomplished and the convalescence completed without incident, so that there is no cause for anxiety. The habit of easy dislocation is a sequela that cannot be foretold. Definite evidence of the pathologic condition in recurrent dislocation is lacking. The limited opportunity for examination of the entire field at the time of operation accounts for much of the difference of opinion. Dislocations are more common in the male than in the female. The disability resulting may be so severe as to prevent the patient from earning a livelihood.

Numerous methods of treatment have been advocated. Henderson recommends the Young operation, which consists in making an incision along the anterior fold of the axilla while the arm is held in abduction, strongly retracting the pectoralis major, and carrying the dissection down to the capsule below the tendon of the subscapularis. An incision is then made into the capsule and three or four mattress sutures of No. 2 chromic catgut doubled are inserted. It will be found that the overlapping of the capsule may be secured readily by rotating the arm. The wound is closed and the arm is held strapped to the side of the body for two weeks, and abduction to a right angle is not permitted for six weeks.

Young also recommends a plastic operation. This is accomplished by an incision starting a little farther out on the axillary fold and extending a little farther down upon the humerus over the bicipital groove. The tendon of the pectoralis major is exposed and the lower half severed. The latissimus dorsi on the opposite side of the biceps tendon is exposed and the inferior half divided. The arm is then placed in a plaster-of-Paris spica, and is held at right angles to the body for from ten days to two weeks.

Henderson reports eight cases treated by the above methods, in five of which the condition was cured. Two were failures, and at present it is too soon after operation to report the result of the other one. He concludes as follows:

1. Recurrent dislocations of the shoulder may be cured by operation, capsulorrhaphy being the operation of choice.

2. Capsulorrhaphy has been found to be sufficient in the majority of cases.

3. Resection of the head of the humerus is not permissible for this condition.

4. Arthrodesis or ankylosis of the head of the bone to the scapula with the arm at a right angle would be an extreme measure, but permissible.

G. W. HOCHREIN.

Pain, A.: Dislocation of Both Hips Without Fracture of the Pelvis. *Brit. M. J.*, 1918, i, 16.

A miner, aged 42, when in a stooping position, was knocked down by the fall of a stone. Examina-

tion showed his left leg flexed, adducted, and internally rotated, and the right leg flexed, abducted, and externally rotated. Both dislocations were easily reduced under anesthesia. Usually the dislocation is not the same on both sides.

V. C. HUNT.

Grégoire, R.: Open Gunshot Fractures of the Patella (Les fractures ouvertes de la rotule par projectiles de guerre). *Bull. et mem. Soc. de chir. de Par.*, 1917, xliii, 1929.

Grégoire quotes the opinions of several distinguished surgeons to show that patellectomy is the rational and necessary treatment of total gunshot patellar fractures. He reports a number of cases to show that patellectomy is not necessary in order to obtain recovery of such a fracture wound.

Grégoire does not think that large opening up of the joint is useful. There are spots which the surgeon cannot reach, and furthermore the knee is able to defend itself if it is aided in freeing itself of the septic fluid, removing the tract where the infecting organisms are disposed, and the projectile which has introduced them.

If it is necessary in the case of the knee-joint to expose all the surface before suture, must suture of the shoulder, wrist, etc., be discarded because it is impossible to explore their entire contour?

The essential point in knee-joint injuries is the drainage of the effusion in the joint. Grégoire confines himself to puncture with a bistoury, introducing it deeply into the joint about 1 cm. behind the patella at the middle point of its internal face. New punctures are made as demanded until the fluid withdrawn is sterile. The details of nine cases so treated are reported.

W. A. BRENNAN.

Besley, F. A.: Value of the Caliper in Obtaining Extension in Compound Fractures of the Femur. *J. Am. M. Ass.*, 1918, lxx, 87.

After stating that the majority of methods of treatment of fractures of the femur are unsatisfactory, Besley says that one faces the problem in war surgery, first, of dealing with the large open wound, and second, the reduction and retention of the fractured bone. The first is the most essential if the patient can be conveyed rapidly to a place where his wound can be adequately treated. The excision of the soft parts should include the skin, superficial fat, fascia, muscles and the loosened fragments of bone. Following this the wound should either be entirely closed immediately or within forty-eight hours, with sutures left loose at the time of operation.

Experience teaches that one is frequently successful in obtaining primary union, but is then confronted with the problem of overcoming the pull of the strong thigh muscles. Besley has seen a large number of compound fractures of the femur which have nearly all been dressed at the front and placed in a Thomas splint and traction applied with adhesive plaster and maintained with a rubber band

attached to the bottom of the splint. The Thomas splint, as it has been modified from time to time, has become one of the most valuable adjuncts in the treatment of fractures with which the author has come in contact. It gives more comfort in transportation and after treatment than any other method of fixation.

In his early cases there were many serious disasters from secondary hemorrhage and extending infection, the chief difficulty being in maintaining traction on the distal fragment owing to the fact that the adhesive plaster would become detached and excoriate the skin. After a trial of many different methods, the Steinmann nail extension was begun and a very satisfactory caliper was made out of meat skewers.

Nearly every patient coming to the author's base hospital has been operated upon, the foreign body usually being removed and the wound excised and left open; so that his hospital deals practically with open, infected wounds. Adhesive plaster, if it has been applied, is removed, the knee shaved and the surface of the skin over the condyle cleansed with alcohol and iodine. An incision about one-fourth of an inch long is made over the respective condyles down to the bone, a caliper inserted, and soft tissues pushed slightly upward and backward, the points of the caliper being driven into the bone just proximal and posterior to the most prominent point of the condyle.

He states that there is comparatively no danger in opening the synovial sac of the knee-joint at this point, and says that it is their intention to drive the caliper into the bone about one-fourth of an inch. He has had but one case in which there was any slipping and this occurred when the caliper was not properly constructed.

The fragments are manipulated as soon as possible, the Thomas knee splint is now applied and is bent at the knee, the acuteness of the angle being dependent on the location of the fracture. The knee splint is supported by other supports placed under the thigh and under the leg so that they can be removed for the daily dressing of the wound. The Thomas splint is so adjusted as to be parallel to the anterior surface of the thigh and of the leg. Over the bed of the patient a Balkan frame is placed to which the necessary pulleys are attached for securing the correct and adequate traction, this being always in the direction of the long axis of the thigh, varying, of course, with the amount of bend in the splint and the location of the fracture. About fifteen pounds of weight are applied and the Thomas splint is also swung by means of pulley and weights to the Balkan frame.

D. N. EISENDRATH.

Lord, J. P.: What is the Best Treatment for Fracture of the Neck of the Femur. *St. Paul M. J.*, 1917, xix, 302.

A considerable number of men are treating cases of fracture of the neck of the femur as they

were treated thirty or forty years ago. It is a common history: unrelieved suffering continued week after week, and the only promise that can be held out is so-called fibrous union, inordinate shortening, continued lameness and permanent crippling. Many of these patients die of exhaustion and suffering.

Exact methods and proper fixation will immediately relieve their suffering, and put the surgeon in complete command of the case. With exact methods and absolute fixation, bony union is a result. Operation and direct fixation have so fully demonstrated the possibility of union that other means are now confidently sought to secure the same results without the attendant risk of an operation, especially in enfeebled, senile patients, or those in the hands of general practitioners, without hospital advantages. Surgeons themselves now seldom practice the open operation, because it is recognized that bony union can be secured by reduction and the maintenance of the fragments in apposition, except in a very small percentage of cases.

The Whitman method is the treatment of choice. The case is in the command of the surgeon from the time the plaster is put on. This seemingly awkward position of abduction is absolutely simple. The case may be turned on its side with the encased limb suspended in air; the patient may be turned over on his face; he may be brought to the edge of the bed and the limb in the cast dropped outside the bed; the patient may sit up and be manipulated at will. There is no danger of disturbing the fracture, therefore there is no pain; and with this freedom of movement, the patient remains in excellent condition.

Bony union does take place in fracture of the neck of the femur if it is early reduced, and if it is continuously maintained in a reduced position. There are no harmful results from employment of the Whitman technique.

Any dressing which does not absolutely fix and retain the fragments, and which requires more or less constant watchfulness and supervision, will not meet the requirements. The same indications in fracture of the hip should be met as in other fractures, namely, correction of the deformity and maintenance of position by an efficient dressing until bony union is complete.

Delitala, F.: Fractures of the Calcaneus Considered with Regard to Their End-Results. (*Le fratture del calcagno considerate nel loro esito lontano*). *Chir. d. organ. d. mot.*, Bologna, 1917, I, 303.

The author examined the statistics of Brind, Westphal, and Tietze as regards the end-results of fractures of the calcaneus. He finds that there is a resulting unfitness for work in from 30 to 35 per cent of such cases. Methodical early treatment cannot prevent grave functional disturbances, but good treatment can reduce these to a minimum.

Calcaneus fractures must therefore be considered

as grave. They produce an invalidism which on the average is equal to about 30 per cent of the whole body value.

The following points should be taken into account before making a prognosis:

1. The alterations in the soft parts, i.e., atrophy, cutaneous and muscular hypertrophy, etc.
2. Subastragalar rigidity and ankylosis.
3. Crunching and pain during movements.
4. Alterations in the form of the foot.
5. Muscular contraction.

Radiologic examination is important in the study of recent as well as old fractures.

The author thinks that structural modifications of the trabeculae have only slight importance, contrary to the theoretic point of view. He also thinks that arthritic alterations do not give radiographic signs. Some illustrative cases are reported.

W. A. BRENNAN.

SURGERY OF THE BONES, JOINTS, ETC.

Steindler, A.: Contribution to Volkmann's Contracture. *Am. J. Orthop. Surg.*, 1917, XV, 741.

The author briefly reviews the literature, noting that the etiologic factor has in most instances been attributed to circular constriction of the parts by plaster-of-Paris bandages, splints, etc., producing ischemia of the muscles, i.e., Volkmann's contracture. The lack of pathologic study in many of the reports on the subject is also noted, the clinical picture and treatment having been principally discussed. Steindler reports the pathologic changes noted, the operations and photographs of five cases treated in the past year.

Photomicrographs are shown and a comparison of traumatic paralysis, infantile paralysis and Volkmann's ischemic paralysis made.

The author sums up the histologic changes in Volkmann's contracture as an interstitial myositis and secondary changes of the muscle fiber, while in infantile paralysis and peripheral nerve lesions the ensuing changes in muscle seem to be more those of a parenchymatous degeneration and secondary infiltration.

H. W. MEYERDING.

Duvergey, I.: Reconstruction of the Synovial Tendon Sheaths by Grafts of Internal Saphenous Vein (Reconstitution des gaines synoviales par les greffes de veine saphène interne). *Progr. méd.*, Par., 1918, p. 14.

A study of 80 war injuries involving interruption of the extensor and flexor tendons of the fingers have shown certain peculiarities to the author.

It is observed that nature makes an effort to repair the damage to the tendons by attempting an anatomic bridging of the tendon ends, utilizing the cicatrix as an intermediary. If physiologic continuity fails to become established, it is because the scar has become adherent on all sides and remains immobile. It is further observed that in a traumatically sectioned tendon, the central end does

not usually become retracted but is inserted in the cicatricial block referred to. This differentiates tendon war injuries from those observed in times of peace. Among the 80 cases studied by the author, in only three or four did he find retraction of the central stump. It is probable that in the case of war wounds the section of the tendon is not so absolute as is usually effected by cutting instruments in civil practice, and the presence of some tendon fibers on the intertendinous cicatrices of war wounds testifies to this.

The author bases his reconstruction technique on these facts. He utilizes the intratendinous cicatrix in reconstructing the tendon and he isolates the reconstructed tendon from the surrounding parts to preserve it from fibrous involvement.

No attempt at repair is made until cicatrization is quite complete. The skin scar is then dissected and the central and peripheric ends of the tendon found. A tongue is then cut from the intratendinous fibrous tissue and with this the tendon is reconstructed in its missing part, the remaining scar tissue being cut away. The tendon stumps are denuded until the synovial sheath is found to be healthy. The reconstructed tendon is then sectioned transversely and a piece of the internal saphenous vein, especially removed for the purpose, is slipped first up over one end and then down over the other so that it entirely protects the denuded part. The tendon is then sutured where sectioned and the piece of vein fixed by sutures in a manner which is explained and illustrated in the article.

The results of the procedure are very interesting. Almost all of the patients operated upon, numbering 78, recovered the functions of the organs involved to a greater or less degree when they left the hospital. Only 24 could be traced after a lapse of time, and of these 20 had entirely recovered their functions.

The author considers the results very encouraging, since without operation these patients would have lost the use of one or more fingers. The physiologic reconstruction of the injured tendon is only possible when it is isolated by means of the venous sheath which replaces the synovial tendon sheath and protects it from incorporation with surrounding fibrous tissue and new adhesions.

W. A. BRENNAN.

Swan, R. H. J.: Primary Excision of Gunshot Wounds of the Elbow-Joint. *Brit. M. J.*, 1918, i, 134.

Fagge criticizes the term primary in speaking of an early operation in distinction from a late or secondary operation when healing has occurred and ankylosis has resulted from the sepsis in the joint. The author agrees with him that the word primary should be reserved for those cases which are operated upon in the casualty clearing station in the first few hours after the infliction of the wound.

The author has been impressed with the fact

that if, in suitable cases, excision of the elbow-joint were performed after thorough removal of the wound and infected tissue and the incisions closed, the results obtained would be much better than if operation were performed when sepsis has become established.

The choice of the cases suitable for excision depends chiefly upon the local conditions. Doubtless the removal of a small attached piece of articular surface is enough in slight injuries, but where the whole articular surfaces are much comminuted and the fracture lines do not spread too far into the shaft of the humerus, it seems that immediate excision of the joint gives best results.

Groves would limit early operative treatment to removal of the detached fragments of bone and suggests drainage of septic cases by division of the base of the olecranon with subsequent reattachment to the ulna. The author has abandoned this method. The olecranon can equally well be preserved by reflecting the triceps with the periosteum of the olecranon on each side by a median posterior incision.

V. C. HUNT.

Bristow, W. R.: A Note on Muscle Nerve Testing During Operation. *Brit. M. J.*, 1915, i, 8.

If on cutting down upon a nerve, a complete anatomical division is found with an end-bulb on the proximal end and perhaps an inch or more of separation, there is no need to test the electrical conductivity of the nerve. However, the exposed nerve may show a thickened area with no anatomical division, and the question arises as to whether or no there is physiological conduction through this. Here a method of determination should be used.

The relative rapidity of return of voluntary power and of faradic excitability after injury is not constant. If the exposed nerve is stimulated, faradic response in the muscles always precedes the return of voluntary power. The author cites a case as evidence of this fact.

The apparatus for making the test of conductivity consists of a faradic coil, metronome, electrodes and connecting cords which can be sterilized. The only essential of the coil is that it shall yield a sufficiently weak current, so weak that it can just be appreciated when both electrodes are placed on the tongue. If the current is strong, the overflow to the muscles other than those being tested causes general contractions, and renders accurate observations impossible.

The metronome interrupter is the simplest method to adopt in testing. The metal probe is held in contact with the nerve, and at each beat of the metronome the electrical circuit is made or broken. The testing electrode, a long metal probe with a terminal at the end for attaching the connecting wires, consists of two platinum wires insulated in a glass handle.

The cords and connections are all sterilized by boiling. The secondary electrode necessary to

complete the circuit is attached to any convenient part away from the field of operation.

The nerve is isolated, a glass rod passed under it and the metal probe placed in contact with the nerve. The core is fully withdrawn, one cell actuates the battery, one layer of secondary is used, and the metronome is started. A normal nerve will be stimulated by this weak current and the muscles supplied by it will contract with each beat of the metronome. If there is no contraction, the current is strengthened by pushing in the core, and if further strength is necessary, by using two layers; any current stronger than this is unnecessary. The testing takes only a minute or two. In stimulating a nerve, as the median, the muscles put into action vary according to the exact part of the circumference of the nerve which is stimulated.

In dealing with incomplete or partial division of a peripheral nerve, it is sometimes necessary to suture part of the nerve and to leave other fibers intact. An exact estimate of the extent of the paralysis is of value. Incomplete lesions are not uncommon in the cords of the brachial plexus and are frequent in the sciatic.

V. C. HUNT.

ORTHOPEDICS IN GENERAL

Sever, J. W.: The Value of Diagnosis in Back Lesions. *Boston M. & S. J.*, 1917, cxxxvii, 857.

By way of preface, the author states that an adequate diagnosis is necessary both from the standpoint of treatment and from a medicolegal standpoint. The liability of the employer to the employee demands a just consideration of the case.

Practically all cases of back disability, as the author points out, are due to falls from a height, and the resulting injury occurs as a result of severe violence applied through the long axis of the spine or while the spine is forcibly flexed.

The author calls attention to the fact that the subject is to be reviewed with reference to definition, method of production, nature of the accident, diagnosis, prognosis and question of disability.

By a compression fracture, he means one in which the vertebra is crushed or flattened, the portion of bone involved depending upon the direction of the crushing force.

Regarding the nature of the fracture he gives abundant evidence that twice as many occur at the level of the first lumbar vertebra as at any other place. This phenomenon he explains by stating that the center of greatest mobility is at this point and that in this area muscular protection alone is all that is afforded.

Kyphosis may result but is not a constant factor. It is valuable as a means of diagnosis, but it signifies only one thing, namely, destruction or distortion of the vertebral body.

As regards symptoms, many cases are not diagnosed because the complaint is stiffness and pain. Few show more involvement with such symptoms

as incontinence, paralysis, etc. Without doubt this is due to the fact that the spinal cord ends above the most frequent point of fracture, i.e., the first lumbar vertebra. The usual complaint of the patient is that he cannot bend freely. The greatest loss of motion is noticed when he attempts to bend from side to side.

The treatment advocated is adequate fixation of the spine by means first of a plaster cast and then a brace. Operation, the author states, is feasible, but not enough data have been collected to prove that much benefit has resulted. The twelve cases cited seem to prove that sufficient care is not taken in diagnosis.

In conclusion the author states:

1. Compression fractures are common and are due to forced flexion of the spine.
2. There is usually no nerve involvement.
3. The patient complains of a weak, stiff and painful back.
4. A good roentgenogram is necessary for diagnosis.
5. Disability for heavy work is permanent.
6. An individual who complains of soreness or stiffness of the back after a fall should undergo careful examination.

JOHN MITCHELL.

Cyriax, E. F.: *The Movements of the Sacro-Iliac Joints*. *Edinb. M. J.*, 1917, xix, 370.

To determine the question as to whether or not the sacro-iliac joints have motion, the author submits a series of tests. He feels that sufficient evidence is not found to support the statement by some anatomists that these joints have a rotary and gliding motion. Such motions as they ascribe have resulted from their studies of cadavers and patients under anaesthesia, in both of which cases the joints are in a state of relaxation.

The tests submitted have been tried in normal subjects: during pregnancy; in cases of subluxated ilium; in cases of compensatory movements of the joints.

In the following manner the author supports his contention that the joints under normal conditions have no rotary or gliding movements:

With the patient on his back, the author placed one hand over one anterior superior spine, and the other below the anterior superior spine of the opposite side. By depressing one hand and then the other he attempted to move one ilium downward and the other upward.

With the patient on his side the author grasped the uppermost ilium over the anterior superior spine with one hand and also grasped with the other hand the posterior part of the same ilium, and then attempted to rotate the whole bone.

With the patient in the same position and the hands similarly placed, the author attempted to move the whole ilium upward and downward.

The conclusions reached are as follows:

1. Under normal conditions the sacro-iliac joints permit of no actual rotary or gliding movements.

2. In early life, since the sacro-iliac joints are not firmly fixed, they may permit of a pathological rotation.

3. The presence of actual movements in the sacro-iliac joints points to the presence of pathology.

JOHN MITCHELL.

Henderson, M. S.: *The Surgical Treatment of Infantile Paralysis*. *St. Paul M. J.*, 1917, xix, 365.

It is the author's desire to consider under this title only standardized operations, their possibilities and usefulness. The treatment, he states, should be so directed that the paralyzed muscles are held in a position of physiologic rest, the position most advantageous for the return of power and the prevention of deformity. Lovett has shown that overwork of a partially paralyzed muscle may delay or even completely prevent the return of power. Carefully graduated exercises and massage undoubtedly conserve and increase the residual muscle power.

Primarily, the author states, it should be realized that the operative measures are palliative and corrective, not curative. The location of the lesion in the anterior horn of the spinal cord precludes the possibility of any logical surgical interference during the acute stages. But there comes a time when the patient ceases to improve under the best direction and treatment by means of braces, massage, and the like. At this stage the operative measures can be well considered.

Neurotization of the paralyzed muscle is attempted by anastomosing a healthy nerve to a paralyzed nerve and by sewing healthy muscle fibers to adjacent paralyzed muscle fibers. These attempts have been clinically unsuccessful. Likewise, the use of silk for artificial ligaments has failed.

The large majority of operations performed for infantile paralysis are necessitated by lack of proper attention, muscle training, massage, and the use of braces.

Tendon transplantation has been resorted to. Operations were performed with no regard to mechanical principles and the results were failures. The question of tendon transplantation must be considered with care. The muscle must be of sufficient strength to carry out the new duties imposed upon it by its transference. In the foot, for example, the author demands before transference of tendons, practically normal power in two of the three muscle groups.

Mechanical principles must be adhered to, and care taken that the transferred tendon perform the function intended. If the peroneals are paralyzed and the tendo achillis and tibialis anticus normal, the foot should first be corrected, if any deformity is present, and the tibialis tendon transferred to the insertion of the peroneal or inserted into the paralyzed tendon near the insertion. The tendon may be split and a portion left in the normal insertion. The extensor proprius hallucis may be utilized to per-

form the work of the tibialis anticus. The biceps or semitendinosus may be transferred into the patella and thus increase the extension power of the knee when the quadriceps is weakened. In the author's experience he has found no value in transference of the peroneals to the inner side of the foot.

Whitman's astragalectomy and Gallie's technique of using the living tendon for a stabilizer are very useful in treatment of certain foot deformities. In certain cases arthrodesis is to be preferred. This should not be attempted in persons below the age of puberty. The social status of the patient should determine the advisability of arthrodesis. For example, when the deltoid is paralyzed but the scapular muscles are working, an ankylosis of the humerus to the scapula at a right angle gives a useful arm.

The conclusions reached by the author are enumerated as follows:

1. Operations for infantile paralysis demand a consideration of the social status, and the careful testing of muscle function.
2. Operative procedures are to be undertaken only after it is certain that power will not return to the paralyzed muscles.
3. The use of silk as artificial ligaments is not advisable.
4. Tendon transference is to be undertaken only when the muscle to be transferred is adapted to perform its new duties.
5. Arthrodesis demands consideration of the extent of the paralysis and the social status of the patient.

JOHN MITCHELL.

Nutter, J. A.: *Some Common Foot Conditions and Their Treatment.* *Canad. M. Ass. J.*, 1917, vii, 1077.

Foot conditions fall commonly into two classes: first, one in which the foot is mechanically at fault; and secondly, one which is due to some infection. The commonest of the mechanical defects is the involvement of the longitudinal arch. Pain results

when too much of the body weight is applied, due to the overstretching of the ligaments, especially the inferior calcaneonavicular ligament. The pain is usually referred along the inner aspect of the ankle and there is tenderness over the scaphoid bone. Pronation of the foot should be looked for and also valgus; pronation, however, being more important.

The recognition of infective processes, such as gonorrheal arthritis or tuberculous disease, should not be overlooked and in a badly pronated foot the diagnosis may not be simple, as a tuberculous focus in or near the ankle almost always causes a pronated condition of the foot. Strapping the foot in an inverted position generally helps a pronated foot and has not much effect on the pain of rheumatoid or tuberculous disease.

The treatment of rigid foot consists of forcibly inverting the foot and holding it in that position by the use of adhesive plaster or a plaster-of-Paris bandage. This forcible inversion is painful and in most cases must be done under a general anesthetic; at times considerable force is necessary. Foot plates are indicated when speedy relief from pain is indicated, when the patient will not carry out the necessary instructions as to exercises, etc., in cases of painful heel and in individuals whose weight is too much for the feet to bear.

Plates should not as a rule be used in mild cases of pronation, as strapping the foot and raising the inner border of the shoe is sufficient. As regards rheumatoid disease, the X-ray is of the greatest value, especially in the examination of the teeth. It reveals forgotten stumps or abscess cavities under bridge work, which even a good dentist may overlook.

The author refers to a case where a shortening of the tendo achillis was the forerunner of a degeneration of the spinal cord, followed by extensive paralysis. He also calls attention to the fact that this should be in mind, and the possibility explained to the patient beforehand.

J. J. KURLANDER.

SURGERY OF THE SPINAL COLUMN AND CORD

Beckman, E. H., and Adson, A. W.: *Spina Bifida; Its Operative Treatment.* *St. Paul M. J.*, 1917, xiv, 1157.

The authors classify spina bifida with regard to its anatomy and operability. Spina bifida is a true hernia. The designation of the hernia depends upon the structure found: if meninges alone are found in the hernial sac, the hernia is named a meningocele; if nerve fibers or a portion of the cord, a myelomeningocele; if a neural canal, the hernia is a syringomyelocele.

The usual site for such hernia is where ossification takes place at a late period of development,

i.e., cervical and lumbar portions. The cause is not known. The choroid plexus stimulates an excess of cerebrospinal fluid. Therefore the sac is due to an overactivity of the choroid plexus and not to secretion in the hernial sac itself.

Spina bifida lends itself to operative treatment, but the authors state the cases must be selected. No case of spina bifida associated with hydrocephalus is to be operated upon unless an attempt is first made to cure the hydrocephalus. Marked improvement in hydrocephalus has been noted by puncture of the corpus callosum. The authors have had no cases under consideration long enough to

prove that cure has been effected. Nor can cures be promised in cases of paralysis of the lower extremities. When paralysis is present it is due to the fact that some of the nerves or the entire portion of the spinal cord, which should supply the lower extremities and furnish innervation to the pelvis, pass out into the spina bifida sac and terminate there. In such cases also, the authors have failed to find an instance of complete recovery of the use of the extremities after an operation.

Before operation is advised the patient should be examined to determine the possibility of a hydrocephalus, and the absence or amount of paralysis present. A roentgenogram should be required to determine bony defects.

According to the authors the suitable time for operation is from nine months, at which time the child can take other nourishment than milk, to two years, when the increased risk of rupture of the sac is greater. Adults with spina bifida are poor operative risks because the tissue about the hernial sac is infected and macerated.

The following technique of operation is advocated:

The patient is placed upon his abdomen with his head twelve inches lower than the spina bifida sac in order to prevent drainage of the ventricles. The sac is opened longitudinally to expose the opening over the spinal canal and the contents of the sac. A simple meningocele is closed with three rows of chromic catgut. If the spina bifida is a myelomeningocele the nerve fibers are divided close to their exit from the point in the spinal canal and replaced within the canal together with the spinal cord. If the sac contains the cord itself, the opening is closed superficially to the cord structures. The first row of sutures is taken in the dura lining the sac; the second row is taken immediately above the first and catches the fascia external to the dura. Before the third row is placed, the dura covering the sac is divided so that the cut edges are brought together and the fascial plains are approximated over the dura. Then the redundant skin is excised and the skin edges approximated with catgut.

After-treatment consists in keeping the buttocks higher than the head. There is no need to close the bony defect since no great tension is needed.

The following conclusions are stated:

1. Spina bifida is caused by increased cerebrospinal pressure.
2. At the time of operation cases of spina bifida should be free from infection.
3. The most suitable age is from nine months to two years.
4. Paralysis associated with spina bifida remain unchanged.
5. Spina bifida associated with hydrocephalus should not be operated upon until the hydrocephalus has become stationary or pressure is relieved by some operative procedure.
6. Adults are not good risks because of the frequency of necrosis of the skin flaps and meningitis.

JOHN MITCHELL.

Elsberg, C. A.: *Fractures of the Spine with Cord and Root Symptoms*. *Ann. Surg.*, Phila., 1918, lxvii, 63.

The author states that the indications for operative interference in fractures of the spine with cord and root symptoms depend on the extent of the lesions of the cord.

He states that extreme conservatism is indicated in the patients with the signs and symptoms of a transverse lesion. In cervical and dorsal injuries, with transverse cord symptoms, an operation should never be performed until distinct and definite signs of returning sensation and reflexes give proof that part of the transverse diameter of the cord is intact.

In crushing injuries of the lumbar vertebrae, on the other hand, in which the roots of the cauda equina are affected, a laminectomy should always be performed as soon as shock has been overcome and after an X-ray picture has been taken. There is considerable experimental and clinical evidence to show that regeneration of divided caudal nerves can occur. Therefore injuries of the cauda equina should be subjected to early operative interference, no matter how "complete" the symptoms.

Elsberg states that patients with evidences of an incomplete cord lesion should be operated upon very soon after injury, if the general condition permits, unless the signs of interference with functions are so slight that no justification for surgical therapy exists. The part of the cord that has been irreparably damaged cannot be benefited, but the compression of a partly crushed cord by bone or blood, or by the intramedullary oedema which follows every cord injury, is certain to cause considerable permanent destruction of nerve fibers. The relief of this pressure or oedema by a wide decompressive laminectomy is certain to be of great benefit.

E. C. ROOS.

Finochietto, R.: *The Route of Approach to the Lumbo-Iliac Region* (Las vías de acceso a la región lumbo-iliaca). *Prensa méd. argent.*, Buenos Aires, 1917, lv, 271.

The author discusses Kock's posterolateral approach to the lumbar vertebral column, which he thinks is only satisfactory when the patient is not very muscular, when the costo-iliac space is not limited, and when the lesions are confined to and situated in the vicinity of the transverse processes.

Mueller's anterior approach is inconvenient on account of the difficulty of drainage.

Finochietto uses a strictly lateral route which gives ample access to the lumbo-iliac region and to the lumbar column with an excellent view of all the organs and perfect command of the situation.

The inconvenience of the costo-iliac space limitation is overcome by means of exaggerated scoliosis of the trunk which is obtained by bending down the patient on the healthy side with the thorax horizontal and the pelvis and lower limb making an angle of about 130 degrees with it.

The costo-iliac space is widely opened. Either the oblique or the angular incisions usually employed to expose the kidney region can be used; but the author prefers the angular, the ascending branch of which uncovers the external part of the sacro-lumbar mass, so as to permit section of the aponeurosis and abdominal muscles.

An accompanying figure shows the method of exposing the vertebral bodies after partial dissection of the psoas muscle; it also shows how the transverse process and the lumbar plexus are found by penetrating behind the psoas. In order to expose the intervertebral foramina and the lumbar nerves, it is best to section the psoas transversely layer by layer and double it back on itself outwardly on each sectioned part.

This route gives good access to the second, third and fourth lumbar vertebrae. In order to gain access to the first lumbar, it is necessary to increase the incision on the upper part by cutting through one or two ribs. The fifth lumbar is best approached by the anterior route.

W. A. BRENNAN

Serra, A., and Valtancoli, G.: *Statistical Researches on 483 Cases of Scoliosis* (Ricerche statistiche su 483 casi di scoliosi). *Chir. di organ. di mor.* Bologna, 1917, i, 380.

The authors' statistics, besides the usual findings as regards sex, age, etc., had as special objects: (a) the clinicomorphologic classification of all cases of scoliosis examined; (b) the statistical study of the location of the different clinical forms and of their deviations.

The method followed by Schulthess, who studied 1,183 cases, has been adopted by the authors. As regards sex, Schulthess found 85.8 per cent females and 14.2 per cent males. The authors' figures are 82.2 and 17.8 per cent respectively. In the authors' cases 12.9 per cent were total scoliosis. This form is prevalently left-sided. Of 62 cases 53 were left-sided. It is relatively more frequent than other forms in males.

As regards the site, the vertex of curvature is more frequently found on the left side between the ninth and twelfth dorsal vertebrae. On the right side the site is more usually in the region of the ninth and tenth.

The general findings of the authors as regards total scoliosis do not differ very greatly from those of Schulthess.

Lumbar scoliosis formed 14.3 per cent of the authors' cases. It is more prevalent in females than in males in the proportion of 58 to 11. It reaches its maximum about the fourteenth year. In this form also it is more frequent on the left side in the region of the first and second lumbar vertebrae.

Dorsolumbar scoliosis was found in 12.2 per cent of the authors' cases and the proportion as regards sex was 55 females for 4 males. Forty-eight were left-sided, as against 11 right-sided. It reaches its maximum from the twelfth to the fourteenth years.

Dorsocervical scoliosis was found in 2 per cent of the authors' cases. The sex proportion was 9 females to 1 male.

Of the authors' cases 113 were simple dorsal scoliosis; 96 were males and 17 females. It is generally found in the region of the fifth to the seventh dorsal vertebrae and is about equally distributed on both sides of the column.

Complex dorsal scoliosis is the most numerous class; the authors' statistics showed 170 cases or 35.2 per cent; 139 were females and 31 males. There is a notable preference for the right side, i.e., 150 right- and 30 left-sided. The region of choice is that from the fifth to the seventh dorsal vertebrae.

Considering the 790 cases as a whole, 435 were left-sided and 355 right-sided. The right-sided showed a preference for the tract between the fifth and tenth dorsal vertebrae. The left-sided were mostly located between the first and second lumbar and the third and fourth dorsal. W. A. BRENNAN.

SURGERY OF THE NERVOUS SYSTEM

Klausner, R.: *Redisposition of the Ulnar Nerve.* *Muenchen. med. Wchnschr.*, 1917, lxiiv, No. 19.

Klausner refers to the technical difficulties of obtaining an exact and secure reunion by suturing the ends of a sectioned nerve. The conditions in the case of the ulnar nerve are very unfavorable; and Klausner has adopted for such cases a simple method of redisposition of the nerve.

After leaving the internal groove of the biceps on separating from the median, the ulnar runs in the bony duct between the olecranon and internal condyle of the humerus. Owing to its situation it is tense when the elbow-joint is flexed at a right angle. As the nerve does not branch in this third, it can

be isolated in the posterior region of the elbow without danger of causing alterations and on separating the fascia which cover the nerve in its bony duct, its isolation is complete.

The nerve can easily be lifted up on its proximal part where it leaves the internal bicipital groove. If the flexor carpi ulnaris is incised, between the fibers of which the nerve runs, the nerve can be freed for a length of ten or twelve cm. Then by flexing the elbow-joint at right angles, the nerve is carried over to the flexor side and a length of 3 cm. gained, which is ample for practicing suture without tension.

Prior to the war Klausner had already practiced

this shifting of the ulnar for a lesion of the epicondyle. There were no inconveniences. He has since practiced it in war hospitals. The method is especially applicable to ulnar lesions in the cubital region; but in higher or lower lesions redispersion of the nerve will result in diminution of tension.

W. A. BRENNAN.

Langley, J. N.: The Separate Suture of Nerves in Nerve-Trunks. *Brit. M. J.*, 1918, i, 45.

The accuracy of apposition of the central and peripheral ends of the several nerve-fibers is a factor determining the degree of recovery from the effects of nerve severance. It is improbable that an exact apposition of corresponding bundles can be made even in a freshly cut nerve, and if a piece has been excised it is certain that exact apposition never occurs. Microscopic examination shows that after suture of the nerve, fibers growing out from the central end of any one bundle usually take a devious course and run to several peripheral bundles. This new arrangement caused by nerve-fibers growing out of their course is spoken of as the distortion of the nerve pattern.

The nerve pattern is distorted both on its efferent and afferent side. On the efferent side the central nerve-cells which formerly in a limb controlled only a flexor muscle may after regeneration control flexor, extensor, adductor, abductor or rotator muscles in various proportions. On the afferent side cutaneous fibers normally giving rise to the different sensations of cold, heat, touch, etc., will run to the muscle and tendon, and muscle and tendon afferent fibers will run to the skin. This necessitates some readjustment of the processes in the central nervous system, in order that reflex and voluntary movement may occur in a properly co-ordinated manner. This takes place quite rapidly in the case of simple movements, but the finer movements are only gradually recovered and the sensory adjustment appears to take a still longer time.

In regeneration after nerve suture there is also a varying degree of loss of innervation by a union of afferent and efferent fibers making a functionless connection.

It has been shown that if after nerve regeneration the nerve be cut above the point of union and the central end of the peripheral branch stimulated, contraction may be obtained in muscles innervated by other branches. This is due to single fibers of the central end dividing into two or more fibers which pass to different peripheral nerves. Such reflected actions occurring in branching axis cylinders the author has called axon reflexes.

The effect of the division of fibers with divergence of the branches will vary according to the nature of the fibers and the nerve-ending, if any, which they make. Thus, when a muscle nerve-fiber divides and makes new nerve-endings in different muscles, a nerve impulse passing down it will cause contraction in both muscles, and when an afferent

fiber capable of giving rise to sensation divides and makes new nerve-endings in different regions, one must suppose that a stimulation of either region will give rise to a sensation referred to both.

From the above facts it may be concluded that any procedure which reduces disturbance of the nerve pattern will make recovery more complete, and will shorten the time taken in attaining that degree of recovery which is possible in the circumstances. It is obvious that if each peripheral nerve ran a separate course in the nerve-trunk and these were sutured separately, the distortion of a nerve pattern would be much diminished; however, in the larger nerve-trunks the bundles exchange nerve-fibers and form a plexus which may be spoken of as the internal nerve plexus. It would seem, then, that in the larger nerve-trunks no separation of the nerves for the different muscles and for different cutaneous areas is possible. Some observers, however, have mapped out the nerve bundles of the trunk of the sciatic into anterior tibial, musculocutaneous, posterior tibial, gastrocnemius and other nerve bundles, and if true, there exists the possibility of suturing the nerves separately in the sciatic.

Hashimoto and the author investigated this possibility and found that the only peripheral nerves having more than a short isolated course in the sciatic were those to the hamstring muscles, the nerve to the short head of the biceps, the lateral cutaneous and external saphenous nerves, the nerve to the outer head of the gastrocnemius and that to the inner head of the soleus. All the others soon after joining the sciatic became connected with the internal nerve plexus and are mixed with nerve-fibers of varied peripheral distribution. The most accessible nerves are the cutaneous nerves.

The nerves to the inner and outer head of the gastrocnemius after they join the sciatic run an isolated course for about one and a half inches.

Most of the muscle nerves arise close together from the internal nerve plexus and run a variable but short distance in the trunk. In the comparatively rare cases of clean severance and immediate operation it is not outside possibility to distinguish the respective central and peripheral ends of one or more of the muscle nerves and suture them separately.

All isolation of nerves causes some interference with blood supply in the isolated portions which may delay regeneration if the inner dense sheath has to be opened.

V. C. HUNT.

Ingebrigsten, R.: A Case of Autoplastic Nerve Graft (Un cas de greffe nerveuse autoplastique.) *Lyon chirurg.*, 1917, xiv, 884.

In previous experimental work the author arrived at the conclusion that a loss of substance in a peripheral nerve may be successfully bridged by an autoplastic transplantation. In most cases, however, the two ends of the nerve can be liberated and joined by direct suture.

Thus the sciatic and ulnar nerves have been

sutured when the two ends were separated from 4 to 5 cm. In the radial, a loss of 7 or 8 cm. has been bridged in this way. In 42 operations on peripheral nerves the author was obliged to resort to grafts in only 4 cases. One of these cases is described.

A soldier was wounded in the elbow and the joint was resected. Fourteen months later he showed symptoms of neuritis of the ulnar nerve. Liberation of the nerve was followed by improvement for a few months and a second liberation gave a much shorter improvement. A resection of 4 cm. of the nerve was then done, followed by an autograft sutured into the gap. For three months the patient seemed

well, but pain then re-appeared and it was necessary to remove the upper part of the graft with part of the nerve.

Histological examination of the removed piece showed that the cicatrization with delay in nerve regeneration was due to considerable alteration in the superior end of the ulna. The effects were not due to any inflammatory lesion.

The author thinks that the failure of such transplantations ought not to discourage further similar attempts. This case was unfavorable owing to the preceding operations and the existing neuritis.

W. A. BRENNAN

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESES, ETC.

Crotti, A.: *Cancer, Ohio St. M. J.*, 1918, xiv, 19.

Cancer is a local disease, always starting in some one spot. It arises after long-continued irritation of various kinds in and about benign growths or ulcerations. These conditions are known as precancerous conditions. For instance, cancer of the lip and mouth arises from pipe smoking, bad teeth, etc.; external cancer from burns, moles, warts, etc.; cancer of the stomach from gastric ulcer; cancer of the gall-bladder from gall-stones; cancer of the uterus from neglected ulcerations or lacerations; cancer of the breast from neglected sores, cracks, and especially from lumps that were at first benign.

The removal of a precancerous condition prevents cancer from developing. Hence it is the duty of every physician to advise the removal of every precancerous condition, especially if there are any signs of changes taking place in it. The safest way is to remove any precancerous condition while it is still quiescent.

Pain is never present in early cancer. When pain is present, it is too late for a radical cure. The first warnings of cancer do not differ from warnings of diseases that are not cancerous; this accounts for the fact that early cancers are so often overlooked.

There is no such thing as "hemorrhage" of the menopause. Every hemorrhage is pathologic and may be caused by cancer. Examine the patient first and prescribe afterward. Any patient in whom a discharge of blood occurs after the menopause may be suspected of malignancy of the uterus, and should be operated upon.

Any lump in the breast which begins to enlarge, harden, and to lose its sharp limits is becoming malignant.

In a patient over thirty-five years old, any persistent indigestion must be regarded with suspicion. In any bleeding of the rectum, the presence of cancer should be eliminated first before treating for bleeding hemorrhoids.

In patients over thirty years of age, any goiter growing rapidly and becoming harder in consistency should arouse suspicion of malignancy. When that goiter has become adherent to the neighboring tissues, it is too late for a cure to be accomplished.

In patients of middle age, any blood in the urine must be considered as of cancerous origin until proved otherwise. An examination should be made.

P. G. SKILLERN, JR.

Forsell, G.: *Statistical Results of Radiotherapy in Cancer* (Statistique des résultats obtenus par la radiumthérapie du cancer). *Arch. à Neurol. méd.*, Par., 1917, xxv, 567.

Forsell finds carcinomata less sensitive to radium than sarcomata. He has treated 69 cases of skin cancer. Fifty of these were cured, 8 improved, and 5 discontinued treatment. In 15 cases of lip carcinoma, 9 were cured. The oldest of these cures dates back two and one-half years. The 6 others are still undergoing treatment and show progressive improvement.

Of 138 other cases of cancer treated, in 126 cases the treatment was brought to a satisfactory end. Six recoveries were obtained, but 2 of these cases were treated by radium after surgical resection. Forty cases were considered permanently and 35 cases temporarily improved.

Fifty-one cases of mammary cancer were treated; 3 did not continue treatment; in 44 cases there were recurrences after operation. One case was cured and 33 improved; in 14 cases there was no result. In 24 roentgen and radium therapy were combined.

In 37 cases of cervical uterine cancer, 7 discontinued treatment, 2 were cured, 12 were considerably improved. There was no result in 13.

There were 30 cases of sarcoma. One case discontinued treatment. In 10 cases there was complete disappearance of the tumor, 2 of these after surgical extirpation; 6 of the cases were inoperable and the disappearance of the tumor in such cases under radium or combined treatment is an eminent success. In 6 cases there has been progressive im-

provement. In 8 cases improvement was followed by aggravation or death. Of the 20 treated cases, at least four-fifths have received substantial benefit.

The author treated 92 cases of benign tumor. Complete disappearance was observed in 37, and progressive improvement in 51 cases.

The author followed the technique of Wickham and Degrais. W. A. BRENNAN.

Yamagiwa, K., and Ichikawa, K.: Experimental Study of the Pathogenesis of Carcinoma. *J. Cancer Research*, 1918, 10, 1.

Papillomatous new-growths, which the authors term folliculo-epitheliomata, may be produced on the rabbit's ear by the application of coal tar for from thirty to one hundred days. By the repeated application of the coal tar, 8 cases of carcinoma in its earliest stage, 16 in an early stage, and 7 complete carcinomata were produced. The carcinomatous change was observed between the 55th and the 360th day. The authors found that the repetition or continuation of chronic irritation may cause a precancerous alteration in epithelium previously normal. If the irritant continues its action, carcinoma may be the outcome, even though no specific agent has been interpolated.

MAN KAHN.

Roffo, A. H.: Cultivation in Vitro of Spindle-Cellled Sarcomata (Cultivo in vitro de celulas de sarcoma fuso celular). *Prensa méd. argent.*, Buenos Aires, 1917, iv, 251.

Roffo's investigations and experiments in the culture of spindle-celled sarcomata were complementary to those already made for the purpose of determining if such cells can live apart from the organism besides increasing or diminishing their vegetative power.

The experiments gave these results:

1. It is possible to cultivate spindle-celled sarcomata of rats *in vitro* in the same conditions as cells of normal tissues.

2. These cells gradually acquire their morphologic differentiation until they reach the fusiform type.

The article is illustrated by a large number of microphotographs. W. A. BRENNAN.

Davis, J. S.: The Use of the Relaxation Incision in Dealing with Extensive Unstable Scars. *J. Am. M. Ass.*, 1917, lxi, 2085.

The treatment of tightly stretched unstable scars which often follow deep burns or extensive loss of tissue from other cause by incisions to release the scar tension is advised and has been practiced with success by the author.

These scars have little resistance to trauma and infection and frequently undergo repeated ulceration. By the use of relaxation incisions with immediate or subsequent skin-grafting of the defects, large unstable scars can be strongly healed in a

comparatively short time and superficial ulcers healed with great rapidity.

It is preferable but not necessary to have the area entirely healed. Unhealed cases are treated till healthy granulations are present, then dressed for twenty-four hours with normal salt solution and the surrounding scar and skin cleaned with alcohol and ether. Local or general anesthesia, as fits the case, may be used.

On the extremities longitudinal incisions are made down to the deep fascia, two or three sufficing. The incisions gap from two and one-half to three inches, and this new raw surface is usually immediately skin-grafted by one of the various methods. In cases of long standing with marked subcutaneous atrophy, skin-grafting should be deferred until the nutrition is restored following the relaxation. If the scar is stretched over a bone, as the skull, multiple incisions may be necessary and should be made down to periosteum, and some under-cutting may be necessary.

With the release of scar tension thus obtained, in addition to rapid but permanent healing of ulcerations, one notes in a few days instead of the thin glossy mottled tissue a thickened resilient area.

K. L. VEHE.

Rouhier: Treatment of the Untransportable Wounded in a State of Shock (Note à propos du traitement des grands intransportables en état de shock. *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 2169).

From his observations Rouhier finds that in abdominal wounds immediate shock is rare and is connected with hæmorrhage. Secondary shock is frequent and is generally coincident with manifest infection. Shock therefore as regards the abdomen is not an entity but a symptom like fever, diarrhœa or tympanites; it is a primary or early or late secondary complication of wounds; it manifests itself essentially by arterial hypotension.

The etiology of shock is sometimes simple and sometimes complex; but however complex the clinical picture may become as the case progresses, and no matter what the symptomatology at the beginning may have been, the result always gives the same picture.

The most rational method of classifying shock is according to the predominating or to the probable cause. Abdominal cases show that the following kinds may be distinguished:

1. Nervous shock, rare in abdominal cases, frequent in cranial and thoracic and consequently in thoraco-abdominal cases.
2. Hæmorrhagic shock.
3. Shock due to cold and fatigue.
4. Shock due to infection.
5. Complex shock in which all the elements are joined to a greater or less degree.

However, outside this category there is another variety commonly observed in cases with multiple wounds. This variety of shock does not depend

either on the nervous state or on hemorrhage, nor is it due especially to cold. It depends on the nature of the wounds and on the contusions and crushing of the tissues. Some of the factors noted above no doubt contribute, but it can exist without them, and it is at once the most terrible of the traumatic complications and for which treatment is inadequate.

This kind of shock can be distinguished from the hemorrhagic, nervous, and septic varieties. The syndrome is not immediate, as in nervous shock, nor secondary as in septic shock; it is primary as in hemorrhagic shock but there is no loss of blood. What is its pathogenesis? The author seems to accept the view that it is a shock due to toxæmia, that the traumatized area is the site of absorption of albuminoid and fatty matters which have been set free by the crushing of the tissues, the gaping veins favoring resorption. He thinks that it is reasonable to suppose that substances of this kind penetrating into the circulation cause phenomena of general intoxication and that the nervous system in its turn becomes involved.

This viewpoint of the pathogenesis is not merely theoretical. There are cases observed in which after an amputation there has been a rapid recovery from marked shock. There are at least five cases of evident shock in Rouhier's observations, in which after amputation of the arm the condition of the patient became transformed after the first day as if a toxic source had been suppressed. Tuffier and others have noted the same thing.

Cases of shock by toxæmia may be divided into two classes: those in which a limb is so shattered that there is no hope of preserving it, and in this case the conclusion of the Interallied Surgical Conference was that immediate amputation was indicated; in the other class of cases the traumatic area cannot be immediately and completely removed and as the aggravation of the general state by surgical intervention is not compensated by the complete suppression of the toxic source, expectant treatment would appear to be the wiser course.

In his advanced station on the firing line Rouhier handled 190 untransportable cases. Ninety died and 100 were discharged in good condition. Of the 90 who died, 43 were operated upon and 47 were not operated upon. Of the 100 evacuated, 91 were operated upon and 9 not operated upon. Of the total 134 cases operated upon, 110 were for hemorrhage. There were 28 immediate amputations or disarticulations, 5 of them double; of these 22 recovered.

Rouhier directs special attention to the immediate application of the hemostatic bandage, either when the wounded man is picked up on the battlefield, or at the first aid post.

W. A. BRENNAN.

Peabody, F. W.: A Report on the Treatment of Myelogenous Leukæmia with Radium. *Boston M. & S. J.*, 1917, clxxvii, 873.

This study is based on the treatment of 36 cases of myelogenous leukæmia treated at the Huntington

Hospital during the last five years. Nineteen of these patients have died, the others are being more or less actively followed. An attempt is made to keep them under constant supervision, as this is considered an important factor in their care.

One of the most striking results obtained was the general clinical improvement. The spleen underwent a rapid decrease in size, the extent varying in different cases. There was also a marked change in the blood picture, the number of white cells in cases which had received no previous similar treatment beginning to fall in from 24 to 72 hours after the radium was applied and continuing to decrease for days or even weeks after discontinuance of the irradiation. The differential count is also modified, myelocytes becoming less prominent. Patients with an anæmia, who respond well to treatment, usually show a rise in hæmoglobin and red cell count. The development of an anæmia in a case under observation is to be regarded as a serious sign. It may be the result of too much radiation. A remission of the leucocytosis usually occurs after a few weeks, when more radium must be applied. In general there is a close parallelism between the leucocyte count and the clinical condition. The white count is the best routine guide to treatment, and attempts should be made to keep it within normal limits.

Regarding technique, with one exception where a few applications were made over the long bones, all the cases were treated over the spleen in the French manner and as described by Ordway. Recent results have seemed to indicate that the administration of one or several large treatments, followed by an intermission of at least several weeks until all evidence of radium action has ceased, is more satisfactory than the use of smaller doses at more frequent intervals. The author is not prepared to say whether the length of life in the cases treated has been prolonged, but temporary remissions of the disease were assuredly produced and patients restored to a useful and functionally efficient existence.

ADOLPH HARTUNG.

Kronberg, G.: A Prognostic Reaction of Urine. *Deutsche med. Wchnschr.*, 1917, No. 24.

Kronberg experimented to find a reaction of urine which would not show special functional or metabolic disturbances but would give an index of the general condition. He found iodine the best agent for this, owing to its great activity and its affinity for the many organic products of metabolism.

For prognostic purposes the iodine is combined with a coloring matter, triphenyl methane (gentian violet and methyl violet), the use of which with iodine and absolute alcohol constitutes the basis of the gram colorative reaction. The iodine solution contains: pure iodine, 1 part; iodide of potassium, 2 parts; distilled water, 200 parts.

In a test tube of 25 ccm. are mixed: 1 ccm. of the iodine solution; 10 ccm. of filtered urine; 1 ccm. of solution of gentian violet, 10 ccm. of absolute alcohol. The mixture is well shaken.

With normal urine or in cases with a favorable prognosis the reaction gives a clear violet azure color of the mixture.

In pathologic cases with an unfavorable prognosis, the color of the mixture is cloudy, varying from a reddish violet to a dark carmine, according to the gravity of the disease and the degree of deficiency of resistance in the organism.

The author says that his method has much wider application and better general prognostic value than the diazo or permanganate, etc., reactions.

W. A. BRENNAN.

Thom, B. P.: Syphilis and Malignancy. *Am. J. Syphilis*, 1918, ii, 40.

In this article the author desires to call attention to the following facts which he has endeavored to substantiate by typical and convincing examples.

(1) Syphilis predisposes to malignant disease. (2) The most malignant forms of syphilis and cancer may exist side by side, the so-called juxtasymphilitic carcinoma or epithelioma. (3) In a syphilitic patient developing cancer, there is almost certain to be a local outbreak of the luetic disease, in close proximity to the malignant growth. (4) In an individual with cancer who contracts syphilis, the malignant disease is stimulated to increased activity. (5) Leucoplacia occurring in syphilitics, especially if tobacco is used to excess, almost invariably causes development of cancer of the mouth or tongue. (6) Epithelioma or carcinoma may develop on a gumma, the two lesions merging, as it were. (7) Syphilis may exactly simulate cancer in any location, either of the viscera or on the surface of the body.

E. C. ROBITSHEK.

Symmers, D.: The Cause of Sudden Death in Status Lymphaticus. *Am. J. Dis. Child.*, 1917, xiv, 463.

Sudden death in status lymphaticus may be brought about in at least two different ways. The first and most frequent cause is of the nature of an anaphylactic reaction due to sensitization of the body by a specific nucleoprotein formed in the lymph nodes as the result of necrosis of numbers of germinal follicles. Before the so-called anaphylactic incubation period has expired, the tissues are again subjected to the action of the same protein formed in the same type of tissue in response to an apparently trivial injury and, in this way, the anaphylactic reaction is completed.

A second cause of sudden death in status lymphaticus is to be found in the form of spontaneous rupture of a hypoplastic cerebral vessel, or rupture following apparently trivial injury, the deficiency in the vessel wall being most noticeable in the muscular coat.

EDWARD L. CORNELL.

Arlitt, A. H., and Wells, H. G.: The Effect of Alcohol on the Reproductive Tissues. *J. Exp. Med.*, 1917, xxvi, 760.

That alcohol may produce distinct anatomical changes in the testicles of those who use it in excess

has been observed from time to time by pathologists for many years, and yet this fact does not seem to be widely known or generally taken into account in considering the effects of alcoholism. In a series of rats given alcohol for varying periods of time to determine the effect of alcohol on the psychology of their offspring, the effect of chronic alcoholism was observed. Altogether the authors examined 15 male rats thus treated, 6 male rats of the second generation derived from them, 18 male rats of the third generation, and 8 male rats of the fourth generation. Approximately the same number of females was also studied. From each animal, with a few exceptions, the following organs were studied: lung, liver, kidney, spleen, stomach, heart, and sex glands. The animals were all killed, while in apparent health, with illuminating gas. They were all of about the same age, six to nine months, except in the case of two which were thirteen months old. All had been fed and cared for under identical conditions except for the administration of alcohol admixed with the food in quantities of from 0.25 ccm. to 2.25 ccm. per day for periods varying from two to ten months. The effect of the alcohol on the rats was, except for those fed for very long periods, to lessen the learning capacity in almost direct proportion to the amount of the dose and duration of the period of administration.

The effect on the body weight was also marked. Animals receiving 2.25 ccm. per diem rate either gained weight far more slowly than the normal animals, or, in some instances, actually lost weight though in the growing period. As regards the offspring, the observed physical effects were, in the case of the offspring of rats receiving 0.5 ccm., a decrease in size and lessened fertility. This was accompanied by a marked decrease in learning capacity. The offspring of animals receiving 0.25 ccm. showed no marked physical changes and were as to intelligent behavior generally on a par with, if not actually superior to, the offspring of normal animals.

The microscopic changes in all structures except the sex glands may be summarized briefly. Nearly all showed more or less pulmonary infection of the type common in rats, consisting in the less advanced stages of a chronic bronchitis with much cellular infiltration and hyperplasia of the bronchial walls. Many showed extension of the process to the adjacent alveoli with a frank mucopurulent bronchopneumonia. The degree of this change seemed to have little effect on the conditions in the other organs and bore no relation whatever to the changes observed in the sex glands.

Only the testicles showed definite changes, but here the effects were so marked and so nearly constant that they stand out conspicuously as the result of the alcohol feeding. Of the fifteen male rats treated with alcohol, the testicles of not more than two or three rats failed to show noteworthy changes, and only one could be called normal. Several different types of changes were observed, and one that attracted attention at once was an apparent decrease

in the size of the seminiferous tubules, and in several instances a distinct decrease in the size of the testicle itself. Measurements were made of the tubules in the testicles from thirty-seven rats, twenty-five tubules being measured from each testicle to secure adequate representation, and then the average diameter calculated. These measurements show at once that there was a distinct decrease in the size of the seminal tubules of the rats that had received alcohol, although in a few rats this change was not present.

The results may be summarized as follows:

Administration of alcohol in the food of male white rats for two or more months, in daily quantities of 0.25 to 2.25 ccm., resulted almost constantly in the appearance of marked degenerative alterations in the testicles. These changes affected the steps of spermatogenesis in inverse order to their occurrence, so that for some time before sterility and complete aspermia the animal was producing spermatozoa with all possible degrees of abnormality and deficiency. The possible relation of this abnormal spermatogenesis to the production of defective offspring was obvious. Individual rats showed marked differences in the degree of change produced by equal amounts of alcohol. The fibrous, interstitial and vascular elements of the testicle were not affected, except for intertubular oedema compensating for tubular atrophy. These experimental observations harmonized with the necropsy findings in human alcoholics. No other tissue was found to be noticeably affected by the alcohol; especially to be remarked was the absence of cirrhosis or fatty infiltration in the liver.

GEORGE E. BEILBY.

SERA, VACCINES, AND FERMENTS

Petersen, W. F.: Serum Changes Following Protein "Shock Therapy." *Arch. Int. Med.*, 1917, xx, 716.

The author believes that it is at present justifiable to consider that the benefits of shock therapy do not depend on any single alteration in the reacting organism, but on a series of factors in which not only the serum antibody and ferment changes, but the leucocytosis, the fever and sweating, and the increased lymph flow have a part, along with the important cellular changes which are as yet intangible.

MAX KAHN.

Bartlett, C. J., and O'Shansky, A. L.: A Modified Wassermann Technique Based upon the Rapid Fixation of Complement Present in Human Serum. *J. Lab. & Clin. Med.*, 1917, iii, 118.

A modified Hecht-Gradwohl method is recommended by the authors, who do not suggest that this method supersede the original Wassermann technique, but who advise parallel determinations by this method and by the old Wassermann technique. The method seems to be an improvement on the Gradwohl modification of the Hecht-Weinberg procedure.

MAX KAHN.

BLOOD

Hartman, F. W.: Pathological Study of Splenic Anemia. *U. S. Naval M. Bull.*, 1918, xii, 13.

The author reports a very interesting case of splenic anemia which went undiagnosed for almost three years; during this time the patient was operated upon for cholecystitis, ventral hernia, and underwent treatment for typhoid fever and liver abscess. His complaint was weakness, pains in the stomach, loss of appetite, and diarrhea. The temperature rose in the afternoon to 103° F. at times. The patient was emaciated, and his complexion had a yellowish tint. Liver dullness extended from the third interspace to 4 cm. below the costal margin. The spleen was easily palpated, and extended 7 cm. below the costal margin during inspiration. There was a moderate grade of anemia; red blood count was 4,000,000; white blood count, 4,000 to 4,600. There was a relative lymphocytosis; myelocytes showed 1 per cent. On X-ray examination there was a remarkable shadow thrown by the spleen.

A splenectomy was done. Twenty-four hours afterwards the polymorphonuclears were increased from 64 to 80 per cent and the lymphocytes decreased from 23 per cent to 11 per cent. White blood count was 12,500.

The spleen was five times the normal size. Sections showed a thickened capsule, and large blood spaces walled by comparatively thick fibrous tissue. The picture was one of hyperplasia of the reticulum at the expense of the lymphoid elements.

Two and one-half months after the operation the patient had gained 20 pounds, all the symptoms had disappeared, and the blood picture was improved. There is increasing eosinophilia, 9 per cent, with continued leucocytosis, which are the usual blood changes following splenectomy. C. A. BOWERS.

Reuben, M. S.: Gaucher's Disease. *N. F. M. J.*, 1918, cvii, 118.

The author reports in full his second case of Gaucher's disease in a child two years of age; the diagnosis in both instances was made previous to the operation. In this second case splenectomy had been advised but had not as yet been carried out.

The case is fully reported and physical findings carefully noted. A splenic puncture was made, the smears of which showed characteristic endothelial cells. The history of a sister four years old, who also has an enlarged liver and spleen, is given.

Reuben concludes by giving a careful review of the historical aspect, etiology, pathology, symptomatology, and course of the disease.

E. C. ROBITSKER.

Kerley, C. G.: The Treatment of Secondary Anemia in Infants by Blood Transfusion. *Am. J. Dis. Child.*, 1917, xiv, 470.

The results in all but one patient were satisfactory. This patient was transfused twice and in

each instance there was improvement as shown by the blood examination, but it failed to hold longer than a few weeks. This child made a gain in weight, but the general improvement was not satisfactory. The abdomen was greatly distended, not unlike Hirschsprung's disease. In the other cases there was no return of the anemia and subsequent growth and development was all that could be hoped for.

A table shows the weight increase and the blood findings before and after transfusion, but it cannot record the marked change in the patients, the change from sickly, fretful infants into happy, apparently well infants. The patients were transformed from those with a digestive capacity barely able to maintain existence into those that took on the normal constructive processes of early life.

EDWARD L. CORNELL.

Marris, H. F.: The Treatment of Thrombosis.
Brit. M. J., 1917, II, 822.

Venous thrombosis as it occurs in typhoid and paratyphoid prolongs convalescence and is followed by swelling of the limb and varicose veins. Marris believes from his experience in seventeen cases that a 0.5 per cent sodium citrate solution quickly arrests the thrombosis of the femoral and iliac veins which is such an unwelcome complication.

In a series of cases treated by giving the sodium citrate by the intravenous route, the average number of days from the onset of thrombosis to evacuation was thirty days, while in those in which the solution was given by mouth, it was thirty-nine days. In the series of seven cases treated by the intravenous method five were evacuated as walking and two as sitting cases and in only one was there oedema present on discharge. In the oral series of ten cases, only five were evacuated as walking and three sitting cases, while two had to be sent to England as stretcher cases, and in no fewer than five cases there was a considerable amount of oedema present as discharge.

The theory upon which the treatment is based is that the sodium citrate aids in dissolving the coagulation of the blood.

D. N. EISENDRATH.

Lee, R. L.: A Simple and Rapid Method for the Selection of Suitable Donors for Transfusion by the Determination of Blood Groups. *Brit. M. J.*, 1917, II, 984.

The numerous blood transfusions which are being done at the war zone have brought out practical lessons which are applicable in civil practice. Lee points out a safe method for such practice. The blood group of an individual follows the mendelian law. Using the arbitrary classification of four groups, it is found that 8 per cent of individuals fall in Group 1; nearly 40 per cent in Group 2; 10 per cent in Group 3; 42 per cent in Group 4.

It is not necessary that the donor and recipient be in the same group. It is important only that the serum of the patient or recipient does not agglutinate or hæmolyze the red corpuscles of the

donor. The reason for this is that in the ordinary transfusion one adds from the donor only about one-fifth to one-twelfth of the total blood volume of the patient. The donor's serum is therefore diluted to prevent its acting in a detrimental way. The patient's blood-cells are also shown to be amply protected by his own serum. Consequently, any transfusion between groups is permissible and harmless, provided the patient's serum does not agglutinate and hæmolyze the donor's red corpuscles, although the donor's serum in the test may agglutinate and hæmolyze the patient's red corpuscles.

The author submits a table demonstrating the interrelationship of the different blood groups.

	Serum of Group			
	1	2	3	4
Cells of Group 1	—	—	—	—
Cells of Group 2	+	—	+	—
Cells of Group 3	+	+	—	+
Cells of Group 4	+	+	+	—

+ = Agglutination and hæmolytic.
 — = No agglutination and hæmolytic.

Group 1 can receive blood from any donor, because the serum of Group 1 will neither hæmolyze nor agglutinate the red cells of any group. On the other hand, the cells of Group 1 are agglutinated and hæmolyzed by all other serums except that of Group 1, its own group. Fortunately, this group is small. A Group 1 patient is therefore known as the universal recipient. In contrast to Group 1 is Group 4, the largest group, whose cells are agglutinated and hæmolyzed by no group, but whose serum will agglutinate and hæmolyze the red corpuscles of all other groups. Group 4 is known as the universal donor group, since the blood of Group 4 can be transfused with safety into any patient. Furthermore, if the patient belongs to Group 4, he can only receive the blood of the same group.

It has been found that persons within the same group vary greatly in the potency of the agglutinating and hæmolytic power of their serums. Thus a cross-transfusion may result in an immediate fatality in one instance, in complete destruction of the red blood-corpuscles, hæmoglobinuria, and marked jaundice but not death in another, and in only mild symptoms in the third patient. The minimum procedure without elaborate tests consists in the establishment of the fact that the patient's serum does not agglutinate the donor's cells.

A rapid test can be made upon a slide, in which the serum of the patient is tested against the red cells of the donor.

Supplies of serums of known groups are kept on hand ready for use. These known persons or test persons can act as a supply to the known serums. The routine method as described by the author, practiced at the army base hospital, is as follows:

With the serums of Group 2, 3, and 4 a number of donors are tested and their names and groups are posted in the operating room. In the event of adequate time, the patient's blood is also grouped, in order to use up the donors of groups other than 4. However, in the case of an emergency no further

tests are necessary. A donor from Group 4 is taken and transfusion immediately performed. This has been found of great help, since patients are brought in who have suffered a great loss of blood, and without further delay a transfusion can be accomplished with a Group 4 donor's blood.

M. A. BERNSTEIN

Unger, L. J.: Transfusion and Unmodified Blood; an Analysis of 165 Cases. *J. Am. M. Ass.*, 1917, *lxix*, 2150.

The article presents an analysis of the effects of transfusion on various clinical conditions, a comparison between the use of modified and unmodified blood, and a summary of the results of transfusions in 165 cases.

The indications for transfusion as stated by the author are: (1) hæmorrhage; (2) diseases of the blood; (3) toxæmias; (4) infections; (5) shock; and (6) general debility. Five cases of gastric or duodenal ulcer received blood for hæmorrhage. Hæmorrhage was checked in all but one case. Two cases of typhoid fever with intestinal hæmorrhage were transfused; one case had no further hæmorrhage, the other subsequently died from profuse hæmorrhage. Four cases of postoperative hæmorrhage were transfused, all with very striking improvement and recovery.

Abnormal mental states due to anæmia vanish when the hæmoglobin and the number of red cells is increased. Three desperate cases of ectopic gestation were so benefited by transfusion that they were successfully operated upon. Transfusions for profuse uterine hæmorrhage were done in three cases, all of which recovered. Repeated transfusions were performed on three patients with ulcerative colitis; all showed marked clinical improvement and two began to respond to local treatment which had previously been ineffective. Of twenty-three transfusions given to check hæmorrhage accompanying blood diseases, eighteen were successful.

The following diseases of the blood were treated by transfusion: secondary anæmia, pernicious anæmia, hæmophilia, purpura hæmorrhagica, leukaemia, bleeding of the newborn, Banti's disease, von Jaksch's anæmia and Henoch's purpura. The effect of the transfusions in these cases is summarized as follows:

In pernicious anæmia transfusion should be recommended, but can be expected to produce remissions in only about half of the cases, in hæmophilia it will stop the hæmorrhage but will not affect the course of the disease; in purpura only one-third of the patients recovered; in acute leukaemia it is of but temporary benefit; in bleeding of the newborn it is a specific and life-saving in character.

Transfusions were performed in the following groups of toxæmia: pneumonia, pyogenic infections, coal gas poisoning, morphine poisoning, uræmia, scurvy, and toxæmia of pregnancy. Four children

with extreme toxæmia from bronchopneumonia recovered after transfusion. Four cases with extreme toxæmia following pyogenic infection died. One case of coal gas poisoning was transfused when moribund and died. Transfusions for uræmia were unsuccessful. One case of scurvy showed immediate and marked improvement. One case of profound toxæmia of pregnancy recovered.

Of five patients transfused for localized pyogenic infections with intractable suppurative processes, three were greatly improved and went on to recovery. Ten cases of bacteræmia following various conditions all received temporary benefit, which was followed by death. The author suggests the use of immune donors in this class of cases.

Three patients were transfused for shock, one traumatic, two postoperative in origin. Two received marked benefit which led to the recovery of the patient.

Six patients with carcinoma, considered very poor operative risks, were transfused preliminary to operation. Four survived the operations and two died. Debilitating conditions, such as interstitial nephritis, acute parenchymatous nephritis and cirrhosis of the liver, were improved by transfusion.

The technique used by the author is that previously described by him and consists in two Record syringes and an instrument for automatically shunting the blood from the donor to the recipient by means of a stop-cock. Ether vapor is sprayed upon the blood syringe to prevent clotting and saline is constantly introduced through the blood cannula while it is not in use. The author is firm in his conviction that unmodified is superior to citrated blood for purposes of transfusion. The question is still undecided, however, and he admits that in acute hæmorrhage citrated blood may be equally efficacious.

The conclusions reached by the author based upon 165 transfusions upon 128 patients are as follows:

The most striking results of transfusion are seen in hæmorrhage, diseases of the blood, toxæmias and shock. In pernicious anæmia remissions can be imitated; if no remission occurs, transfusion should be repeated with a different donor. The results in toxæmia associated with acute infections are encouraging. If employed at the onset of shock, the symptoms will be overcome.

Transfusion assists in overcoming intractable suppurative processes and causes a marked increase in the vitality of the patient. It is not successful in the treatment of bacteræmia. It is useful as a pre-operative measure to improve the patient's condition. It will prolong the life of patients suffering from debilitating diseases.

The syringe cannula method has proved a simple, efficient, and dependable one for giving whole unmodified blood, which is preferable to citrated blood when blood is required as a tissue. Citrated blood will serve as a substitute to replenish impoverished circulation.

ELIAS FISHER

BLOOD AND LYMPH VESSELS

Sinclair, T.: Ligation of the Innominate Artery for Traumatic Aneurism of the Carotid. *J. Roy. Arms. M. Corps.*, Lond., 1917, xxx, 701.

The aneurism in the case reported filled up the space between the clavicle and the upper border of the thyroid cartilage, extending across to the line of the common carotid of the left side and overhanging the subclavian on the right. It measured approximately 4½ by 4 inches.

The artery was exposed by a rectangular incision in the midline and along the clavicle. On detaching the sternal head and part of the clavicular head of the sternomastoid and partially dividing the sternohyoid and sternothyroid muscles, it was found that no space was available between the clavicle and the aneurism. One and one-fourth inches of this bone were therefore resected. The inferior thyroid veins and the larger veins were retracted without damage. The innominate artery was found behind the middle of the manubrium; on tracing this, it became apparent that the common carotid was so incorporated in the aneurism that the placing of a ligature upon it was impracticable, and therefore the innominate was tied with a single strand of No. 4 catgut. The placing of a distal ligature was omitted in this instance, as the effects were considered dangerous.

The postoperative course was uneventful and the patient was discharged in less than a month. Later examination showed no cerebral deterioration and the mental functions were normal. The aneurism disappeared. Circulation and sensation in the hand were good but there was some feebleness and stiffness in the fingers.

The secondary hæmorrhage, septic complications, embolism and cerebral ischemic softening which may occur in such cases were not observed in this case. The innominate has been infrequently ligated, not only on account of anatomical reasons, but also on account of the feared cerebral complications.

W. A. BRENNAN.

POISONS

Dudley, D. G.: Successful Treatment of Anthrax by Various Methods. *J. Am. M. Ass.*, 1918, lxx, 15.

In treatment by excision, as soon as the diagnosis is made, the skin is scrubbed gently with soap and rinsed thoroughly with sterile water. The skin is painted with aqueous 8 per cent phenol solution or stronger, and rinsed with alcohol. Next the lesion is painted with collodion to avoid contamination of the incision. Eight per cent phenol is injected into the tissues all around the lesion to wall off the infective process. From three to five syringefuls of solution, about 60 ccm., will be sufficient. One-fourth of an inch outside this phenolized zone five or six syringefuls of 25 per cent alcohol are injected. These injections are usually made within one and one-half inches of the center of the lesion. The line

of incision is painted with 8 per cent phenol and an area from two and one-half to three and one-half inches in diameter is excised. After the excision, the base and edges of the wound are painted with pure phenol and immediately neutralized with absolute alcohol. The surface is cleansed with alcohol and a wet dressing applied. The author has used boric acid, 20 per cent alcohol, and hypertonic saline solution. Ordinarily this terminates the case.

When excision fails, the injection of three or four syringefuls of 8 per cent phenol into the oedematous zone may effect a cure. If not, the tissues are incised freely, the course of the oedema being followed, and gauze drains are put in. Phenol is injected into the tissues, due regard being paid to its toxicity, and an ice bag is applied.

At this time anti-anthrax serum should be used. The author uses the serum furnished by the United States Bureau of Animal Industry, Washington, D. C. The first dose is 35 ccm. injected intravenously, followed within from eight to sixteen hours by a second dose, given intramuscularly or intravenously. This dose is repeated if necessary. The only cases of chills or fever that the author has ever seen in connection with anthrax occurred following this injection.

In conjunction with this treatment, salts in full doses should be given, strychnine, one thirtieth of a grain, every four or five hours. The patient should have plenty of fresh air and should keep quiet. A tracheotomy tube should be kept handy in case the oedema reaches the larynx.

Two cases are reported. EDWARD L. CORNELL.

Vernoni, G.: Recurrent Tetanus of War Wounds (Sul tetano recidivante da ferito di guerra). *Gazz. d. osp. e d. clin.*, Milano, 1917, xxxviii, 955.

The author reports 4 cases of recurrent tetanus in war wounds. The history of the cases shows that the germs of tetanus remaining encapsulated within a wound which is apparently cured are dangerous, and may at any moment, independently of any new traumatism or secondary surgical intervention, recommence to proliferate, causing fresh attacks of tetanus.

The cases reported further show that not only massage but even the simple action of solar light or simple muscular exercise, which of themselves are quite mild as traumatic factors, can in certain circumstances transform an old focus into a new source of infection of the organism.

All 4 cases reported recovered.

W. A. BRENNAN.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Fiole, J., and Delmas, I.: Wide Exposure of the Vascular Trunks in the Buttock Region (La découverte large des troncs vasculaires de la fesse). *Presse méd.*, Par., 1917, p. 709.

The authors refer to the operative difficulty of exposing the vessels in the buttock region. This

difficulty is due to three principal causes: (1) The vessels are deeply situated under the thick mass of the gluteus maximus, (2) the classical incisions, which differ according to the artery, are very insufficient, (3) there is not one, but three vascular groups, and it is impossible to know, when the region is distended with blood, which is the injured trunk.

The route of access in this region must be such as to give plenty of light; this is essential to a correct operation, whether ligature or the treatment of an aneurism. All vessels should be exposed, and the nerves also, especially the sciatic, because an injury by the bistoury or the bite of a forceps will cause unfortunate consequences.

The gluteus maximus muscle is the great obstacle to wide exposures. The authors have devised a technique which overcomes this obstacle and which calls for no muscular section. The patient lies on the abdomen, the side to be operated upon being slightly raised. The thigh is raised and a slight external rotation movement given which relaxes the gluteal muscles. The posterosuperior iliac spine, the iliac crest and the great trochanter are located by palpation and outlined very carefully.

The incision begins in the middle of the external face of the great trochanter about three finger-widths below its superior border; it ascends vertically toward the superior border, passes it and continuing vertically about 2 cm. higher, it then bends and proceeds upward and inward in the direction of the posterosuperior iliac spine, at 2 cm. from which it stops. Underneath is the aponeurosis which hides the great trochanter, and the thick fat tissue which covers the muscles. This fat is incised, following the trend of the fibers of the gluteus maximus until the aponeurosis is reached.

The vessels are situated between the gluteus maximus behind and the gluteus medius, the pyramidal, the internus obturator and the gemellus in front. This space is filled with loose cellular tissue. In order to find this layer, begin at the base of the incision and cut the aponeurosis vertically on the external face of the great trochanter and a little above it. The index finger is then introduced into the aponeurotic opening and the contour of the great trochanter felt and followed toward its posterior face. It will penetrate under the gluteus maximus muscle and the finger can be pushed even to the sacrosciatic notch.

The posterior aponeurotic lip is raised with two forceps and the external edge of the gluteus maximus found. In this edge are united the posterior aponeurosis of the muscle and that which covers its deep face, the union being marked by a whitish line in the gluteus medius. Scissors are introduced and the tissues cut along this line. The tissue here is thin and no muscle fascia is injured. The section is continued as far as the iliac crest. The gluteus maximus is detached along all its external edge. It is easily raised up, exposing all the deep muscles and the superficial branches of the gluteal vessels. The muscle is drawn inward and backward by a

wide flat retractor and a complete view is obtained not alone of the gluteal but also of the pyramidal, the obturator and the gemellus, as well as the great and small sciatic nerves, the ischiatic vessels and the branches of the gluteal vessels. A little higher up under the bony arch the two gluteal branches unite in the main trunk of the gluteal artery itself.

The vascular operation desired can then be done. In closing the wound, the drains should be placed above the great trochanter and kept clear of the sciatic nerve.

W. A. BRENNAN.

ROENTGENOLOGY

Coues, W. P.: Skeletal Radiography as an Aid to the Diagnosis of Obscure Syphilia. *Am. J. Syphilia*, 1918, ii, 97.

Following a brief review of the literature of the bone lesions of syphilis, with which a bibliography is given, Coues states that, through the use of skeletal radiography, many bones show the characteristic appearance of specific inflammatory processes without any manifest symptoms, i.e., silent skeletal syphilis. It has been found, moreover, that in individuals without specific history these characteristic changes were at times present.

Further study of this subject has demonstrated that certain individuals, ailing for years with obscure chronic conditions in which definite diagnoses could not be made, showed definite specific changes in certain bones, which gave the key to an otherwise blind and baffling condition. In these cases a definite history of syphilis seemed entirely lacking, but when an exhaustive history was taken by one with an adequate knowledge of the more obscure signs of syphilis, extremely suggestive facts were noted.

Coues believes that the Wassermann reaction is a mixed blessing in diagnosis and that perhaps twenty per cent of all syphilitics give a negative reaction. If skeletal radiography were used in conjunction with serologic tests, and the findings passed upon by competent observers, the number of syphilitics in a given community would be very much augmented.

Obscure swellings in the neck, supposed to be tuberculous, and leg ulcerations supposed to be varicose, have had their correct etiology demonstrated by skeletal radiography, the Wassermann reaction being oftener negative than positive. In a number of cases the diagnosis has been further confirmed by the examination of tissue and the therapeutic test. This point should be borne in mind in delayed or fibrous union of fractures and the ulceration or delayed healing of wounds.

To pass judgment in a suspected case, experience and long study are necessary. Differences of bone structure which are normal must not be interpreted as specific, and other abnormal bone conditions must be differentiated. The fibula, for instance, having many surfaces, is more difficult to judge by than the tibia, but characteristic proliferations on

its surface are detected as often as on the tibia. The use of skeletal radiography should be more common, and in conjunction with the Wassermann reaction it will give very accurate data as to the presence of syphilis.

DAVID R. BOWEN.

HOSPITAL, MEDICOLEGAL, AND MEDICAL EDUCATION

Goodwin, H. C.: *The Hospital; a Teaching Institution.* Albany *M. Ann.*, 1918, xxxix, 1.

The author sums up the following advantages of a teaching hospital: first, to the patients, because of the complete equipment such a plant provides; second, to the attending men who must keep to the front or be superseded; third, to the internes who are fortunate enough to secure an appointment; fourth, to the student body which is allowed the freedom of the hospital; fifth, to the training school for nurses, which always has before it the examples of well-trained men doing careful work; sixth, to the surrounding community which, as a result, has a higher standard of practicing physicians in its midst; seventh, to the physicians in the surrounding country, who are able to see in consultation the best men in their respective specialties; eighth, to science, because in the teaching hospital new therapeutic and diagnostic methods can be studied by means of the trained clinicians and laboratory workers; this cannot be done in a non-teaching hospital since the latter has neither the properly qualified staff nor the equipment.

In other words, the advantages to the community are so great that all should unite in its common support and no institution of this character ought to be embarrassed for a single moment by lack of funds. The wealthy men of this country and the foundations created by their wealth are realizing that efficiency in hospital work is as necessary as it is in a manufacturing business, and that the lowest per capita cost does not always mean the best managed institution. Waste in everything should be discouraged, but money spent in teaching and study is potential energy being stored up for future use and is the best kind of preparedness for a community.

The organization of a teaching hospital cannot be loose or haphazard. The board of managers must be keen men, interested in the large affairs of life, and public-spirited enough to devote much of their time to the proper fulfillment of the trust imposed upon them.

The best method of organization is for the university to maintain its own hospital; then the control is always certain and the wards will ever be freely open to the teaching force. As this is not always possible, the arrangement of interlocking boards or agreements should be made, but in such a way as to insure permanency.

The superintendent and the principal of the nurses' training school should have been trained under the methods in vogue in teaching hospitals

so that they will readily grasp the point of view and needs of the teaching force, whether it be in the way of material to work with or of nurses to supervise special work and departments. This means that the superintendent of such an institution should be a physician who has enjoyed the widest opportunities himself, for it cannot be supposed that a man whose training has been along other lines can develop the understanding and sympathy necessary for the proper administration of a hospital in conjunction with a medical school. The administrator who fails to take advantage of every opportunity for conferences with the professors or heads of the different teaching departments will soon find that he is not in touch with the aims and cannot see the whole picture of which each department is a part.

The staff should have a continuous appointment and should be appointed only when holding the same position in the university.

No hospital should attempt to affiliate with a university medical college as a teaching institution whose finances are in a poor condition.

The physical condition of the plant should be so arranged that there are enough wards for each department. Adjacent to the wards should be small clinical laboratories fitted up completely for the routine work and under the supervision of a technician specially trained for this work. In addition to small clinical laboratories, there should be the larger laboratories for physiological chemistry, bacteriology, pathology, roentgenology, electrocardiography, etc., as well as the operating rooms to accommodate the different specialists.

The dispensary should be modern and absolutely under the control of the same departments in the medical school. Here also should be laboratories so equipped that certain clinical diagnosis work can be undertaken. If the laboratories are not near at hand, students fail to see the relation between physical diagnosis and laboratory work. Here, as in the hospital wards, the student body of the third-year classes should assist in dispensary routine and study the different cases under proper supervision. There should be rooms enough so that they can work either singly or in groups of two in preparing the histories, physical examinations and suggestions for treatment of patients who come to the clinic.

The autopsy room should be well equipped and under the control of the pathologist. This is the place where the mistakes of diagnosis are clearly shown and where the student can see for himself what he has been more or less surmising while following the case in the wards. In no other place can gross pathological conditions be so thoroughly impressed on the student mind.

There should be a library and record room in which are kept the standard books and periodicals and the completed records of cases treated in the institution, with desk room enough to encourage the students and internes to use them. The records

should be accessible by carefully kept card indexes. These indexes should be as follows: a name index and a disease index compiled after some standard classification and properly cross-indexed for complications, etc. The case records should contain in detail a complete history of the case before admission, physical examination and notes during the hospital stay, together with all the data from the different laboratories.

EDWARD L. CORNELL.

Wynne, S. W.: The Need of Standardizing the Statistics of Child-Caring Institutions, Foundling Asylums, Etc. *Arch. Pediat.*, 1918, XXXV, 939.

The adoption of a uniform method or system of recording and tabulating the statistics of child-caring institutions is of primary importance, and efforts should be directed toward this end.

Briefly, the system is as follows. At the termination by recovery or death of each case of illness occurring among the children under charge, the institutions forward to the Central Bureau of Records a report or certificate giving the important statistical data. In the Division of Statistical Research the information contained in these reports is coded and transferred to what are known as "punch cards." From the punch cards the desired tabulations are prepared with the aid of a Powers electrical sorter and counter.

The advantages of such a system are: first, uniformity; second, economy; third, absolute accuracy; fourth, preservation of the original data in such form that it is always readily accessible, so that special studies or reports can be prepared promptly and economically. EDWARD L. CORNELL.

MILITARY SURGERY

NOTE.—Readers are referred to the Table of Contents for other articles dealing with military surgery which appear under the various headings according to our anatomical arrangement.

Mayo, C. H.: Medical Service in the United States Army. *St. Paul M. J.*, 1917, XIX, 351.

The author reviews some of the records of former wars to prove that inefficient and insufficient medical care accounted for most of the deaths, and he refers with pride to the splendid medical record of the present war.

Reference is also made to the present low rank of medical officers, which should be elevated. He calls attention to the tuberculosis situation during and after the war. A plea is made for the careful apportioning of the medical service of the country, so that the civilian population may not suffer too serious neglect.

H. H. FREUDICH.

Heiser, V. G.: Some Accomplishments of Italian Medical Men in the War. *J. Am. M. Ass.*, 1918, LXV, 24.

Italy has a standing army now of approximately 4,000,000 men and has 1,000,000 hospital beds. The equipment for these many beds has been derived practically altogether from Italy herself. The care of the sick and wounded is divided between the Army Medical Service and the Red Cross of Italy. The wounded are relayed back from the firing line to the base in practically the same manner as in the other allied armies.

The Army Medical Service has erected where necessary one story pavilions, 14 feet high, 18 feet wide, and of any necessary length, built of iron and hollow tiling; while the Red Cross hospital accommodations are mainly in converted hotels, schools, etc. Hospitals are being located nearer and nearer the front as it is deemed advisable to risk the occasional danger from shells in view of the great advantages of early treatment. Many of these hospitals are in dugouts thirty to forty feet

underground; others in the mountains are hewn out of solid rock, practically on the first firing line.

Specialization has been carried out to a high degree. Large re-educational institutions have been established. The foundation of huge quarantine stations, both back of the front line in northern Italy and also in the south to take care of the men returning from the east, marks an important achievement. These stations have accommodations for thousands of men, have large sterilization and disinfecting outfits and maintain efficient laboratories where routine stool tests for cholera, typhoid and dysentery, and blood tests for malaria are made.

The laboratories have done much to keep down the morbidity rate of the above mentioned diseases. About 5,000 cases of tuberculosis are said to have appeared in the army; the venereal incidence is small. During the period of inactivity in the winter months a medical school has been established in northern Italy for students released from the trenches.

R. B. BETTMAN.

Lower, W. E.: The Application of Military Surgery to Civil Practice. *Ohio St. J. Med.*, 1917, XXI, 819.

The exigencies of cases in time of war develop a resourcefulness and simplicity of action that can be copied in civil practice. One of the accomplishments of tremendous importance obtained in military practice is blood transfusion in the treatment of hemorrhage. The experience obtained in a few months cannot be acquired in years of civil practice.

The author calls attention to the use of the Thomas splint in fractures of the femur. No other treatment practiced in this war stands out so conspicuously and satisfactorily nor is more universally applied. The splint used is a standard, unmodified Thomas splint. It can be quickly adjusted over the

clothing and extension applied to the limb so that patients can be transported any distance in comparative comfort. The author recommends the placing of this splint in factories and shops as part of an emergency equipment.

Permanent extension is applied either with adhesive plaster or Sinclair glue, consisting of glue solid 40 per cent, calcium chloride 1 per cent, aqueous 50 per cent; this glue must be warm when applied.

The ring of the splint must get its support from the tuberosity of the ischium and not press tightly against the perineum. Sufficient support must also be given above and below the seat of fracture. This is provided by perforated zinc cradles, or by bandage supports, extending in a hammock fashion across the frame. Extension is preferably made from above the knee, but if an external wound will not permit the application of such an extension, it can be made from below the knee.

For cases in which there is much deformity and overlapping, and in which the ordinary extension is not sufficient, extension by a rubber band to the frame is very satisfactory. This rubber should be of sufficient elasticity and strong enough to overcome the muscle pull. The continual pull of the rubber band takes up the slack as soon as the muscle has been tired out and holds the fragment in position. It also prevents the spasmodic action which often occurs at night from the muscles pulling the fragments past one another, which produces the great pain accompanying such an occurrence.

M. A. BERNSTEIN.

Peat, G. B.: The Effects of Gassing as Seen at a Casualty Clearing Station. *Canad. M. Ass. J.*, 1918, VIII, 17.

Of 65 cases entering the casualty clearing station, two were dead on arrival and three died before any remedial agents could be employed. Of the rest, 15 were cases in bad condition, 25 severe, and 20 fairly mild.

An officer badly gassed was restless, almost convulsive. There was marked dyspnoea; respiration was 64; the chest was full of moist râles. Pulse was 128, and of good quality. The skin was pale and the finger nails of leaden hue. He was treated with atropine, gr. 1:75, and morphine, gr. 1:6 hypodermically, and given inhalations of aromatic spirits of ammonia and oxygen inhalations every hour for fifteen minutes. Hydrogen peroxide, one half drachm to an ounce of water, was administered every hour. Oxygen up to four liters was given subcutaneously in the pectoral region. When improvement set in he was given potassium iodide to loosen secretions. This man was back on duty after two months.

Of the group admitted, four died during the night and the following morning. The very grave cases, in addition to the treatment already described, received camphor in oil caffeine and digitalin, gr. 1:100 hypodermically. One of this group died.

Nearly all cases complained of tightness in the throat and lungs. There was a cough in 60 per

cent of the cases. Respiration was increased in most cases. Cyanosis was present. Nausea and vomiting occurred in most cases, and there was obstinate constipation. The mental symptoms varied from pronounced restlessness to a dazed or sleepy condition.

Indications in treatment are outlined as follows:

1. Get oxygen into the system.
2. Keep the patient quiet.
3. Relieve the heart and keep it supported.
4. Relieve the lungs and rid them of secretions and detritus.

I. E. BISHKOW.

Reports of the Interallied Surgical Conference for the Study of War Wounds. *Arch. de méd. et pharm. mil.*, Par. 1917, LXVIII, 105, 141, 180, 400, 465.

LABORATORY METHODS

The Interallied Surgical Conference at its meeting May 14 to 19, 1917, heard reports on the scope, methods, and value of bacteriologic laboratories in connection with war surgery by Leishmann, Govaerts, Renaux, and Veillon. The Conference adopted the following conclusions:

1. In every important surgical unit, there should be an experienced bacteriologist, a doctor having under his direction assistants sufficiently instructed and capable of conducting the various steps in laboratory work.

2. The treatment of war wounds calls for collaboration of the surgeon and the bacteriologist. The latter should be in direct contact with the wounded and he ought to study and discuss with the surgeon the researches necessary and the course to follow.

3. The researches to be made are generally of the bacteriologic, cytologic and serologic order.

4. These researches should not be circumscribed to a narrow limit. They should consider: (a) the bacteriologic state of the wounds in the initial phase; (b) wounds before and after surgical treatment, and before and after a removal to a long distance; (c) wounds which continue to suppurate, or which show any complication; (d) sterilization of the wounds, in view of suture; (e) bacteriologic and biologic control of wounds in order to estimate the degree of effectiveness of the different methods of treatment; (f) examination of the blood by culture, quantitative and qualitative counts, coagulability, defensive properties, and possible indications for transfusion; (g) special infections of joints, serosa, connective tissue, muscles, cerebral matter, and cerebrospinal fluid; (h) general indications for and application of vaccine therapy.

5. In regard to those laboratories now attached to surgical units for the practical work of surgery, it is desired that more laboratories should be created for scientific research and for the study of general questions of war surgery, or at least that those which already exist should be given over to this end as far as possible.

GASEOUS GANGRENE

The Conference took up the consideration of reports by Sacquépée, Testi, Govaerts, Veillon.

Makins, Derache and Duval, and came to the following conclusions regarding the gaseous gangrene of war wounds:

1. Pathogenesis. There are two sets of causes which favor the development of gas gangrene; one general and the other individual. General causes may be (a) geographical variations; the frequency and clinical type of gaseous gangrene seems partly subordinated to geographical circumstances; (b) the kind of projectile; artillery projectiles or grenade fragments produce the most dangerous wounds.

Regarding individual causes, a certain number of peculiarities are almost constantly found in wounds which tend toward gangrene. The most important are: (a) situation of the wound in the fleshy part of a limb, especially the lower limb; (b) special disposition of wounds, i.e., a narrow orifice with important deep lesions; (c) the presence of foreign bodies, especially fragments of clothing, bringing with them particles from the soil containing faecal matter; (d) extensive contusion of tissues with partial necrosis.

Other favoring circumstances, although not constant, are very frequent, such as large bone or joint ruptures; ischemia consecutive to vascular lesions, ligatures, or haemostatic bandage; multiplicity of wounds; hematoma; true traumatic shock. The chances of gangrene are much less if effective and complete surgical treatment is done very early; even after a suitable operation, the appearance of gangrene is favored by early evacuation of the wounded or by using an insufficient treatment, especially after the use of dressings which allow wounds to become dry. Attention is drawn to certain intoxicating factors in gangrene, namely, local or general acidosis.

2. Bacteriology. Research has confirmed the infectious origin of gaseous gangrene and the anaerobic nature of the microbes which cause it. Among the microbes met with are the septic vibron, *Bacillus belloneus* (the exact relation between *Bacillus belloneus* and *Bacillus oedematis* is still doubtful), and *Bacillus perfringens*. Infection is often aggravated by the addition of other microbes, especially the streptococcus.

Following the general principles of bacteriology, investigations have been made with a view to obtaining sera active against the above named microbes, anticipating their use in serotherapy; such sera have been prepared and their action demonstrated in animal experiments.

3. Treatment of gaseous gangrene. Gaseous gangrene is very frequently the consequence of delay or insufficiency in the surgical treatment of wounds. Prophylactic treatment is the most important. It comprises the rapid evacuation of the wounded to a surgical center where they can receive the necessary care; wide stripping of the wounds; excision of contused or dead tissue; removal of foreign bodies; careful haemostasis.

In localized forms, with or without infiltration, the curative treatment consists of (a) completely

exposing the deep tissues to the air; (b) excising all gangrenous or suspected tissue; (c) making longitudinal incisions in the zone of infiltration to the limit of this zone.

Amputation is indicated in early massive gangrene, especially if complicated with severe osseous or vascular lesions; also in the rapidly invading forms with a generally disturbed condition, rapid fall of blood-pressure is in this case a most valuable sign. The method of choice is that named plane section. When the amputation is in healthy tissue, British surgeons recommend short skin-flaps fixed in eversion. When the amputation is in an infiltrated zone, the infiltrated zone of the stump ought to be freed by means of incisions extending high on the root of the limb or trunk.

Nitrous oxide-oxygen anesthesia should be that of choice; failing this, ether should be used. In case of extraction of projectiles or secondary or late operations, it must be remembered that this may cause a re-awakening of gaseous gangrene.

FRACTURES

The papers by Tanton, Nigrisoli, Moynihan, Tuffier, Dos Santos, Derache, Veillon and Arbuthnot Lane on the fracture wounds of war were discussed and the following conclusions adopted:

1. Choice of apparatus. In treating a diaphyseal war fracture, reduction is the method of choice.

The method of immobilization may include: (a) temporary immobilization at the first aid station; (b) definite immobilization at the surgical center; (c) immobilization during transport.

Temporary immobilization should as far as possible approach the definite type and should permit transportation.

Prolonged immobilization should provide for mechanical extension, easy access to the wound, and evacuation of the patient.

2. Arm fractures require (a) temporary immobilization at the first aid post. The Thomas splints and crutch apparatus give excellent results, and their general adoption in the army is desirable; (b) prolonged immobilization. The above-mentioned apparatus or splints which permit abduction of the limb are indicated.

3. Fractures of the forearm require (a) temporary immobilization at the first aid station. A metallic grooved apparatus with the elbow at right angles or a simple wooden splint are sufficient; (b) prolonged immobilization. The forearm should be immobilized in supination, and the apparatus should as far as possible permit application of mechanical extension and variable degrees of elbow flexion. The Thomas and Sinclair apparatus, the interrupted metallic splint plaster apparatus, or Van de Valde's splint fulfil these indications.

4. Fractures of the thigh require (a) temporary immobilization at the first aid post. The best apparatus is the Thomas type. It is well to add to the original splint a foot-piece in order to avoid the heel being pushed forward while resting on the

stretcher, (b) prolonged immobilization. The apparatus selected should permit abduction and flexion of the limb, i.e., the Thomas splint, the suspension apparatus of the Anglo-American type, Delbet's or Alquier's apparatus. Delbet's apparatus allows very early walking.

The multiplicity, the situation, the extent of the lesions of the lower limb and intolerance for any apparatus authorize the employment of Finocchetto's stirrup. Addition of a splint of the Thomas type to this stirrup allows transportation of the patient while preserving extension.

5. Fractures of the leg require (a) temporary immobilization at the first aid station. The Thomas type splint, the metallic gutter splint, or wooden splints fulfil indications; (b) prolonged immobilization. The apparatus of choice should permit application of mechanical extension. Plaster apparatus combined with metallic extensible splints and movable posterior splints, extension apparatus with suspension, and the Thomas splint fulfil the indications.

It is advantageous to begin walking as soon as possible. The best apparatus which permits this is Delbet's. If the situation of a wound demands it a metallic bridge splint should be substituted for the plaster splint. Finocchetto's stirrup either alone or associated with a Thomas splint has the same indications in leg fractures as in thigh fractures.

6. Wrist fractures require (a) temporary immobilization at the first aid post. A metallic gutter or a wood splint provides sufficient immobilization; (b) prolonged immobilization. Jones' splint is an excellent apparatus.

7. Instep fractures require (a) temporary immobilization at the first aid post. A metallic gutter splint suffices; (b) prolonged immobilization. An interrupted plaster apparatus will also serve as a walking apparatus. The Jones metallic splint is equally good. When transporting the wounded, if the apparatus must be removed, a plaster apparatus should be substituted.

Regarding the surgical treatment of fractures, at the first aid station the treatment of fractures comprises: (a) dressing of the wound; (b) immobilization; (c) immediate treatment of complications such as hæmorrhage, shock, etc. Immobilization of the limb should be obtained provisionally.

At the first surgical center all fractures should be examined, submitted to radiology, and operated upon if necessary. Crushed limbs and gangrenous segments should be amputated as far as possible in the fracture area.

Seton bullet wounds with small entry and exit orifices without intermediate swellings and without lesions of the important vessels should be immobilized in a Thomas splint, a gutter splint, or in plaster. The wound should be treated aseptically. The patient should be supervised for at least a week, and if well characterized local or general symptoms develop, the fracture should be operated upon.

All other fractures should be operated upon.

The wound should be stripped by an incision large enough to permit deep exploration of the whole fracture area, with excision of the soft parts and extraction of the foreign bodies.

Treatment of the bony lesion should provide careful removal of free bone chips and those which are only held by a very narrow bridge and are thrown into the muscle parts. Resection should be free and subperiosteal. The irregular jagged bone extremities which menace the blood-vessels and nerves are regularized by the bone forceps. The lavage fluid is left to the choice of the surgeon. Ether and Dakin's fluid are preferred by most.

The wounds should afterward be treated by primary or secondary suture. At the present time immediate suture of the soft parts is done only exceptionally and in the following cases: by the experimenting surgeon; during a military lull and with satisfactory facilities; in wounds less than eight hours old; where the bone and muscle injuries are not extensive, even after excision of all contused tissue; when resected areas are easily closed up; where there is the possibility of supervising the patient until complete recovery. The most favorable regions are the face, cranium, flat bones, hand, and foot. At the first symptoms the sutures should be opened and the wound disinfected.

Secondary suture should be preceded by sterilization. Carrel's and Morrison's methods give good results.

Fracture cases should not be evacuated during the period of infection. Reduction is obtained by operation and controlled by radiologic examination. Certain fractures rebellious to any reduction will be advantageously maintained by osteosynthesis. This intervention ought to be practiced as far as possible after sterilization of the fracture area.

Uniformity in the treatment of severe fractures in the different units improves the conditions of treatment.

Mobilization of joints, muscles and tendons of the fractured limb is called for during the whole treatment and ought to commence as early as possible.

BRAIN WOUNDS

Reports on war wounds of the brain were submitted and the following conclusions were adopted:

1. At the first aid post brain wounds are covered with a simple aseptic dressing.

2. Men with cranial and cerebral wounds are evacuated according to the apparent severity of their injuries: (a) as rapidly as possible in cases of large losses of substance with severe general disturbances; (b) if the lesion seems less serious, if the general state is not so menacing, the patient will be evacuated to a hospital center in which there is a specialist surgeon and neurologist and where he can remain for a long time. Operation ought to be early.

3. A man with a brain wound ought not to be evacuated before three weeks after trepanation for a craniocerebral injury.

4. The cranium should be examined radiologically and projectiles and bone fragments carefully searched for.

5. It is still a matter of discussion whether there is an indication for trepanation when a cranial fracture is not manifest, and when no cerebral symptom exists.

6. Local anaesthesia for operation is the method of choice. A sitting position has the advantage that it diminishes hemorrhage, and is especially applicable in secondary and late operations.

7. Opening up the wound is done by resection of its edges. Its enlargement is effected according to the situation, the direction and the form of the bone lesions.

8. Loss of bone substance will be enlarged by the bone forceps, exceptionally by a trepan, never by the chisel and mallet, up to the limits of the cerebral confusion.

9. If the dura mater is intact, it will be respected; and in favorable cases the wound will be united by first intention. If it is jagged, the edges will be trimmed and the orifice enlarged to the size of the area of the cerebral lesion.

10. Clots and cerebral exudates, as well as superficial foreign bodies, will be cleared away by a jet of warm physiologic saline solution; deep bone chips and projectiles easily accessible will be removed under the strictest precautions.

11. Very small projectiles deeply embedded and not easily accessible, more voluminous projectiles situated at the base of the cranium or in the ventricles, and those which are situated in the hemisphere of the side opposite the lesions should be primarily respected.

12. In bipolar wounds, each orifice will be treated on its own account, and the deep region of the trajectory should be respected.

13. No drain nor mesh should be placed in the cerebral substance. The craniocerebral wound can be treated by primary suture or by secondary suture after sterilization. Researches are necessary to know which of these two methods best obviates immediate or deferred septic complications.

14. The patient, as soon as he recovers from operative shock, will be placed in a half-sitting position.

15. Early cerebral hernias without deep infection should be treated by enlarging the osseous breach.

16. Thin cicatrices with large loss of bone substance and those which give rise to cerebral disturbances will be treated by plastics.

17. The secondary complications will be treated according to their origin, i.e., abscess of the brain, foreign bodies, adhering scars, by operations appropriate to each of these complications, and after consultation between surgeon and neurologist.

WOUNDS OF THE NERVES

After discussing reports by Conrad, Gosset, and Moynihan on wounds of the nerves, the Conference adopted the following conclusions:

1. In the surgical units at the front it is necessary that the greatest care be exerted in seeking lesions of the peripheral nerves both by clinical examination and by direct examination in the wound at the first intervention.

2. Whenever a peripheral nerve-trunk is found sectioned, if the conditions of the wound permit, primary suture of the nerve should be done, and mention of this suture should be made on a special report to accompany the patient.

3. If the nerve has not been sutured during the primary treatment of the wound, or if the lesion has passed unperceived, the necessary operation should be done when making secondary reunion of the wound.

4. This operation, primary or secondary, of itself suffices for the functional restoration of the nerve. In any case it puts the nerve-trunk in the best condition for a later operation, if such is necessary.

5. Later on the various functional defects consecutive to nerve lesions may be the object of different operations undertaken after examination made by a neurologist.

6. During the whole treatment, special supervision should be given to a good position of the limbs, to the working of the joints, and to the nutrition of the muscles.

7. Operations on nerves, no matter of what kind, call for perfect asepsis, much minuteness, and a delicacy of touch in handling the nerve itself.

8. Suture should be done in the nerve extremities resected, as far back as the healthy tissue; the lower end should be normal in aspect and deprived of any fibrous tissue which is an obstacle to regeneration.

9. Contact between the two nerve extremities appears to be necessary for regeneration; it seems, however, that suture at a distance and suture by "dedoublement" of the lower end can be employed when nothing else can be done.

10. Grafts up to the present time have not given any special results.

11. Instead of nerve suture, recourse may be had to tendon transplantation: (1) when nerve suture is impossible; (2) when the functional result in spite of the operation on the nerve-trunk is insufficient.

W. A. BRENNAN.

Morgan, O. G., Sauer, F. D., and Schlesinger, E. G.: Some Aspects of the Treatment of Infected War Wounds. *Brit. J. Surg.*, 1918, 5, 435.

The authors very properly call attention to the fallacies that are apt to creep into the conclusions of those who treat war wounds in active campaign, since the observations are apt to be confined to the time in the passage of the wounded from the front to a base. In the present war, English observers may divide their opportunities to observe war wounds and their infection into three stages: (1) at the front proper, (2) at the bases in France, and (3) at the bases in England. The authors in this instance desire to limit their views to those matters

which relate to the treatment of infected wounds at the base in France.

The divergent views which are expressed in the literature from time to time as to the efficacy of similar methods of treatment no doubt sometimes come from an "attempt to argue from facts, observed in one place, to a purely imaginary set of conditions in another."

The trials of a wounded man in war are not appreciated save by those who have witnessed his agonies from the front to the base. In the first week he suffers from the initial shock and loss of blood; from transport, very often rough; from the lines through a field ambulance to the casualty clearing station and then to the base. All this time he is apt to suffer from surgical interference and the distress of infection. The first few days after arrival at the base are occupied by sleep.

Fractures arrive in splints adopted to the emergency conditions in war and these have to give way to suitable immobilization of a kind best adapted to hospital treatment. This may or may not necessitate the use of an anæsthetic, notwithstanding the fact that one had been employed a very short time before, at a casualty clearing station.

The first attempt at treatment at a base hospital is directed toward the nonspread of existing infection. The measures include: (1) rest or immobilization, by splinting; (2) rapid removal of all dead tissue by the use of the hypochlorite solution of Dakin and Daufresne according to the Carrel technique. Carrel tubes are placed in position during the anæsthetic, if one is used, and intermittent irrigation is at once commenced. As nature's defenses are not yet established, it is advisable to do as little surgery in this stage as may be consistent with proper management. If necessary, after immobilization, pain may be controlled by drugs.

Remember that the resistance of the wounded is usually impaired by a period of great stress and that they are a prey to the more virulent infections.

As to the lines of treatment, the authors discourse very interestingly. The present war has brought out the claims of two schools in a great controversy, namely, (1) the reactionaries or antiseptic school; (2) the progressives or physiological school.

The school of antiseptic methods holds that since sepsis is caused by micro-organisms, when these are once destroyed the aims of this treatment have been attained, and when the wound fails to become clean under the mode of treatment employed, there is some detail or principle at fault in the use of the particular substance employed.

The physiological school claims nature as their laboratory. When dealing with an infected wound, the method of the latter is to limit as rapidly as possible the depredations of the invading organisms by destroying the food on which they live, and at the same time to guard against farther invasion by setting up a strong zone of defence around the wound. The first of these two, the destruction of the pabulum on which the microbes feed, is accomplished

by liberating trypsin from dead pus. Trypsin so liberated splits up the protein of dead tissue, thereby forcing the micro-organisms to attempt their destructive activities against living or fighting cells.

Further invasion of the injured tissue is hindered by throwing out a band of leucocytes where the injured and sound tissues meet.

Of these two methods, the one most likely to find favor is the one which more nearly imitates nature's way.

Rapid removal of all dead tissue is the best method of dealing with infection in war wounds, but it must be practiced in the very early stages of treatment. If one waits until infection is actually in progress, the method will fail.

The neutral hypochlorite solution of Dakin and Daufresne is of great proteolytic value, chiefly due to the fact that it is itself destroyed as soon as it comes in contact with the tissues, which, on the other hand, prevents its irritating effects from interfering with tissue cells. Its action on coagulated protein is very much more powerful than trypsin. The fact of its rapid decomposition in the presence of dead tissue renders the necessity of rapid accession of fresh solution very necessary. This object is achieved by the intermittent irrigation method of Carrel.

Nature's method of dealing with an infected wound, the establishment of a zone of leucocytes, is best aided by absolute rest and a minimum of interference by the surgeon.

Treatment of the wounded part is by absolute rest. This is best done by careful splint and subsequent suspension of the limb from overhead pulleys with accurately balanced counterweights so that any movement of the patient in bed is followed by the splint without disturbance of the injured limb or pain therefrom. Pain in a wound is always or nearly always the result of faulty immobilization, unless one excepts pus under tension.

Sinclair's glue is preferred to secure extension. In dealing with fractures and wounds of the lower limb, Thomas' splint is almost entirely used, either straight or bent and suspended in extension on the Hodgen principle, the end of the bed being elevated.

The method of immobilization for fractures generally employed is minutely detailed in this important article, and those who are engaged in war surgery will find many valuable hints.

In the treatment of the wound itself the following rules are laid down:

1. Destroy as rapidly as possible all dead tissue in a wound by intermittent irrigation through Carrel's tubes with the hypochlorite solution of Dakin and Daufresne. This can only be done by a careful and proper adjustment of the tubes.

2. Tubes for deep wounds are provided with few holes only, because pressure of flow is here required; while surface wounds do best with tubes liberally perforated because low pressure is here called for.

3. Two sets of tubes are kept ready, deep and surface tubes connected to different supply reservoirs.

4. Do not use too many tubes, lest the attempt at drainage is defeated by tubes acting as stoppers, to prevent drainage. Tubes properly placed are not disturbed, except as they become misplaced or blocked, for seven or eight days. In the case of compound fractures, verify the correct position of the tubes by a radiogram. Continuous irrigation is not recommended because, as already stated, the hypochlorite is destroyed in a few seconds after contact with protein in solution, and it is necessary to allow the tryptic and phagocytic processes undisturbed opportunity to cleanse the wound, and this is best done in the intervals between flushings in the intermittent irrigation.

5. In the early states of wound treatment when dead tissue is more plentiful, irrigate as often as once per hour; later once in two hours.

6. The hypochlorite becomes irritating as soon as the wound becomes free from pus and then it becomes necessary to carefully vaseline the surrounding skin.

7. To minimize the disturbance of dressings, use large pads made of layers of wool between gauze in lieu of wool and bandages. After the pads have soaked up the discharge, the over-flow runs into a metal tray, placed under the part, and the fluids are then conducted into bottles beside the bed. The pads are changed every day at first, and then less often, until they may be later allowed to remain in place as long as one week. Proper adjustment of the tubes should be carefully watched. In guillotine amputations dressings may be left untouched for a week or ten days.

The ordinary surgical principles observed in the management of infected wounds should not be lost sight of, i.e., complete drainage by the opening of the wounds of entrance and exit, as free opening up as is necessary, and the employment of well placed counterincisions, as in the case of compound fractures. The remote parts of wounds located in pockets should be made accessible to the solution since dead tissue in some recess unassailed by the hypochlorite will persistently reinfect the wound.

In acute sepsis it is not sound surgery to practice too much manipulation in search of hidden pus. With complete immobilization a barrier is spread against any general spread of infection. Localized pus can be more advantageously let out later when its presence is determined by a fluctuating abscess and again it may spontaneously evacuate into the general cavity of the wound. A spreading cellulitis or acute abscess must be dealt with preferably in bed, under gas, which insures a minimum of movement to the affected part.

Cases are kept at this base hospital until serious complications are unlikely.

In the case of fractures, perfect position of the fragments must be maintained, at least as perfect as possible.

The removal of loose fragments of bone should

not be practiced too radically. If all loose fragments are removed, "a more rapid sterilization and quicker closure is obtained." In other words, the surgeon by this practice converts a compound fracture to something akin to a simple fracture, and incurs a minimum of sepsis. The authors are inclined, however, to a middle ground in the removal of loose pieces of bone. They remove all completely detached fragments. They leave any piece bearing attachment to the tissues. These pieces are apt to become firmly attached later and they play an important part in the deposit of callus along the line of the bone. There can be no doubt that by this attitude the probabilities of obtaining a better bone anatomically are greater.

As to the question of complete closure of a wound, in compound fractures when the bacteriological count warrants such a procedure, the authors believe that this can only be successfully practiced in simple cases. The moment for evacuation has usually arrived when closure of these war wounds is considered, and the procedure is made risky.

Considerable advance has been made in the present war in the treatment of infected joint wounds, and many limbs are now saved which were lost formerly.

The plan of washing out and closing joint wounds at the front, and more particularly knee-joint wounds, has on the whole yielded good results. Primary closing is practiced at the casualty clearing station. While suppurative arthritis may supervene up to two weeks or more after closure, such a contingency is the exception rather than the rule. In the successful cases an almost perfect joint is the result, while in those with failure the attempt at perfection has not set the case back materially. Extension seems to be the first essential of treatment and the earlier it is applied, the more hopeful is the outcome. Cases where the injury is located anterior to the crucial ligaments offer better hope of recovery to both life and limb. The amount of pull in efforts at extension must be sufficient to ensure an actual stretching of the ligaments and separation of the joint surfaces. This it is claimed is best accomplished by the use of the extension stirrup devised by Finochietto which is shown among the illustrations.

If arthrotomy is decided upon, provision must be made to give free access to all parts of the joint by the irrigating fluid. In inflammation in the anterior part of the joint, incisions on either side of the ligamentum patella and a small incision at the topmost part of the suprapatellar pouch will suffice. In cases running a favorable course the irrigation tubes can be withdrawn to the level of the capsule after a few days and movements as far as the extension apparatus will allow may be practiced. In cases of posterior crucial spread of the inflammation, early incisions are not advocated lest new paths of infection are opened up. It is better to rely on the extension to confine the inflammation to the anterior part of the joint, and to allow pus to point behind, before interfering.

The elbow joint presents injuries which very much resemble fracture of the long bones rather than injury to epiphyseal ends, and therefore the early treatment by washing out and suturing is seldom possible. Incision, as in fracture, to all parts of the injured area is the essential point in the treatment. When arthrotomy is required for a suppurative arthritis complicating a fracture around the joint, the authors have used a longitudinal incision over the head of the radius in preference to the more usual posterior incision and they then treat the joint in flexion rather than extension. They follow this plan also in cases of elbow injury which may require separate incisions to expose all parts of the joint. They claim that the incision over the head of the radius "brings the orbicular ligament under the eye of the surgeon, and allows early interference in case of infection before the all-important radio-ulnar joint becomes disorganized."

Excision of the elbow is not favored because of the great readiness with which infection in these cases has come under control with simple drainage and hypochlorite irrigation.

On the subject of amputation, the authors tend toward extreme conservatism in spite of the fact that many limbs shattered by the missiles of war may be saved and remain useless. While they admit also that the attitude of extreme conservatism may have ended in death at times, still it often happens that quite sound limbs have been saved which at one stage appeared impossible to save.

Wounds of muscles require careful attention, as they are apt to end in massive scar-formation. Rest is just as essential in wounds of muscles as in compound fractures, and this is specially so where tendon sheaths are open to the spread of infection. By the use of hypochlorite solution, sloughing and suppurating muscle wounds are freed of all dead tissue in a few days except where dead tendon tissue is present. This should always be removed by cutting away with scissors. When such wounds are closed early after sterilization, avoidance of much disability and many painful and contracted scars is practically certain. When suppuration and a high bacterial count persist beyond the usual time in deep and through-and-through wounds of the thigh for instance, if no foreign body is present, it will often happen that a portion of dead tendon will be found on exploration.

Multiple wounds have shown but little reaction in some cases. They are not severe and the patient exhibits little or no resistance to infection. Pus is not present, and there is no evidence of local inflammation. These patients grow steadily worse and die in shock or with symptoms of shock. These cases present a difficult pathological problem to the authors, since it is not clear to them why the shock should be so severe in a patient whose "total wound area may be considerably less than that of a vigorously reacting single-wound case."

Septicæmia and secondary hæmorrhage are the two severe and at times dangerous complications.

Septicæmia is prone to occur with insufficient drainage and faulty immobilization, especially when subject to stress of transport. For these reasons the complete early closing of wounds when transport impends, and when no absolute certainty can be felt that infection is completely mastered, should be employed.

Secondary hæmorrhage is nearly always associated with extremely septic wounds. The latter is usually the result of insufficient drainage; and for the prevention of both sepsis and hæmorrhage, free drainage would seem to be the first important measure to adopt to avoid ugly complications.

The authors express the view that the hypochlorite solution is unimportant as a bactericidal agent, and that its undoubted value in the treatment of infected wounds depends on its power of destroying dead tissue on which the bacteria subsist. As the dead tissue disappears, the organisms diminish in number. The nature of the flora of wounds treated by hypochlorite shows that the coliform and sporing bacilli disappear first, then bacillus welchi, and that the streptococci are the most persistent.

Concerning experiments with the hypochlorite solution on muscle, catgut, silk and cotton, which were all readily destroyed *in vitro*, the authors remark that destruction of suture materials which might be disastrous fails to take place in a wound in which hypochlorite is used because the amount of protein in solution present is sufficient to neutralize the hypochlorite as it is introduced.

The plan of bacteriologic control follows the method of Carrel in noting the character of organisms, the nature of cells, the relative number of mononuclear cells and their preservation, phagocytic activity, etc. The chart showed a steady downward tendency in the number of organisms so long as dead tissue continued to be evenly eliminated. On the other hand, a persistently high bacterial count almost always indicated the presence of a foreign body.

As regards the cell contents of the films, at first only polymorphonuclear leucocytes are seen. As sterilization proceeds, large lymphocytes and endothelial cells appear, as many as 6 to 7 of the polycells. A large number of mononuclears is sometimes seen when there are still many organisms in the wound, but in general the appearance of mononuclear cells is a favorable indication.

The authors pay tribute to Carrel and his co-workers at Compiegne for their valuable technique in the treatment of war wounds.

The article is accompanied by an appendix which gives results in 154 gunshot wounds, showing the number of days the wound had existed on admission, the missile causing the injury, the temperature in each case, the presence of sepsis and the number of bacteria per microscopic field, the number of days required to cause disappearance of dead tissue, to obtain sterility, the time of treatment and the condition of the case at time of transfer, all of which affords interesting data.

L. A. LAGARDE.

GYNECOLOGY

UTERUS

Esquerido: Results of Radium Application in Uterine Cancer (Resultados de la aplicación del radium en el cáncer del útero). *Terapia*, Barcelona, 1917, ix, 681.

The author has used radium in 12 cases of uterine cancer since February, 1916. In 3 cases of operable cancer, all recovered. In 7 inoperable cases there were 3 recoveries, 1 improvement, and 3 still in course of treatment. In 2 cases of inoperable epithelioma of the cervix and uterine corpus, the tendency is to grow worse.

In 2 cases of recurrence after operation, the application of radium obtained a reduction of cicatricial fungi in one.

W. A. BRENNAN.

D'Onofrio, M.: Clinical and Anatomic-Pathological Note on a Rare Uterine Tumor (Note cliniche ed anatomico patologiche di un raro tumore uterino). *Gazz. d. osp. e d. clin.*, Milano, 1917, xxxviii, 1262.

The patient was a primipara of twenty-three years, in a state of dystocia. On examination a hard oval mass about the size of a lemon was felt in the cavity of the lower pelvis. On incising the overlying tissues the mass, which was hard, was detached and extracted. The fetus was alive and was immediately extracted by forceps. The mother recovered.

The mass extracted weighed with the attached soft parts 900 grams and dry weighed 550 grams. It was oval in form, greyish-yellow in color, and rough. Microscopic examination after decalcification showed that it was essentially composed of connective tissue. There were no traces of cellular elements. The tumor was a hard fibroma which had become calcified. It originated from the neck of the uterus as a so-called interstitial tumor, which develops in the thick wall of the uterus, as distinct from the subserous or submucous tumors which develop toward the uterine cavity. The site of the tumor explains its fibrous structure.

W. A. BRENNAN.

Warner, F.: Uterine Fibroids with Reference to Their Tendency to Become Sarcomatous; a Study of 100 Consecutive Cases. *Am. J. Obst. N. Y.*, 1917, lxxvi, 333.

Warner bases his pathological study of sarcomatous changes in uterine fibroids on the ground that the so-called fibroid is, as a rule, a leiomyoma, for the tumor develops from the smooth muscle-cells of the organ in which the growth is situated. As a result of the production of quantities of newly developing smooth muscle-cells, the formation of new connective tissue is stimulated. This later, by

contraction, obliterates more or less the original constituent parts of the smooth muscle-celled tumor. On the other hand, rapid growth of the tumor produces a myoma relatively free from connective tissue. It is this latter type of growth which the author regards as peculiarly apt to become sarcomatous.

The examination of 100 consecutive specimens of uterine leiomyomata gave the following results:

Seven per cent were of the very cellular type, 18 per cent moderately cellular; 75 per cent of a scirrhous character; 24 per cent showed hyaline degeneration, in some cases extensive, in 3 per cent of the arteries only, 22 per cent were nodular, in 10 per cent the arteries showed sclerosis, though sections from many specimens were not cut so as to show the arteries, wherefore Warner believes that the percentage of arterial degeneration would far exceed this figure. Two per cent were complicated with sarcoma, while 5 per cent were of the very cellular type and apparently well on the border-line of malignancy. One per cent showed carcinoma, though in many the cervix was not examined owing to supravaginal hysterectomy. Twelve per cent of the specimens showed rather rich lymphocytic infiltration.

The author believes that, with two of these tumors definitely sarcomatous and five more well on the road to sarcoma, "histologically malignant but clinically non-malignant," seven per cent in all, the importance of the early removal of these tumors is strongly suggested.

CAREY CULBERTSON.

Stage, S. J.: Uterine Myomata. *J. M. Soc. N. Y.*, 1918, xv, 1.

In reviewing the pathology of uterine fibromata, Stage emphasizes the resemblance of the tumors to pregnancy; especially is this true of the submucous variety, which distends the whole body of the uterus symmetrically, as the growth of the tumor is toward the cavity of the uterus under its mucous coat with a broad or sessile base. The submucous or subperitoneal tumor grows toward the peritoneal cavity under the peritoneum and usually produces an irregular or nodular outline of the uterus, or may become pedunculated.

The interstitial variety begins in the muscle wall and has a tendency to extend outward or inward, passing into one of the other varieties.

When the removal of a myomatous uterus becomes necessary, a complete hysterectomy is best; however, if co-existing conditions, such as cardiac insufficiency, nephritis, or any other contra-indications to a prolonged operation are present, and the cervix healthy, the latter may be left.

The author reports a case of a multipara forty-four years of age, who came to be treated for cardiac and renal trouble with no pelvic symptoms for about two years. She permitted no vaginal examination until a uterine hemorrhage made it imperative. A large symmetrical uterine growth was discovered, causing a severe internal hemorrhage as well as pain by pressure on the sacral nerves.

On account of the weakened condition of the patient, a supravaginal amputation was done with an uninterrupted convalescence and general improvement.

L. R. GOLDSMITH.

Graefe, M.: War Amenorrhœa in Germany Due to Denutrition. *Muenchen. med. Wochenschr.*, 1917, lxi, No. 18.

Graefe of Halle reports an increase in amenorrhœa since the beginning of the war, in young girls who have reached puberty. Amenorrhœa is not infrequent in cases where the conditions of life are changed at the time of puberty. In the present instance the change is one of diet. This differs from the pre-war diet in poverty of flesh and fat. There is also a prolonged physical and intellectual weakening.

Since the beginning of the war Graefe has noticed that amenorrhœa has increased from 1.5 to 5 per cent of all the cases treated in his gynecological clinic. Other authors report the same.

A circumstance found to accompany the genital symptoms was diminution in volume of the uterus.

The author is of opinion that the cause lying at the bottom of the type of amenorrhœa observed is defective ovarian secretion. He points out the possibility of such amenorrhœa reaching a degree which ends in sterility. This is a serious matter at the present time, when it is desired to increase the number of births.

This condition of war amenorrhœa was not noted in previous wars; but this fact is not surprising, since in no previous known war were all the conditions of life so profoundly modified as in the present one, especially the modification in diet, qualitative as well as quantitative.

W. A. BRENNAN.

Rongy, A. J.: Prolapsus Uteri and Its Treatment. *J. Am. M. Ass.*, 1917, lxi, 1863.

The author believes that the factors concerned with the production of prolapsus uteri are: (1) the construction of the bony outlet; (2) the general muscular development of the patient, especially as regards the muscles of the pelvic outlet; (3) the size of the child, particularly in cases which are overdue.

The first two factors are concerned with prophylaxis in the adolescent in the form of exercise, improved personal hygiene, and early recognition and management of hypophyseal and epiphyseal dysfunctions. The third factor is absolutely under control in the large majority of cases. No primipara

should be allowed to go overtime on account of the increased size and rigidity of the fetal head.

The ideal method for the correction of pelvic hernia in the form of uterine prolapse is, according to Rongy, the interposition operation. The most important single step in this procedure is to select the proper point for fixation of the anterior wall of the uterus to the roof of the vagina. If fixed too high, pressure symptoms on the neck of the bladder, and if too low a sense of bearing down in the vagina, results.

Women of the child-bearing period upon whom this operation is done should be sterilized lest abortion or dystocia result.

Discussions of this paper by Newton, Aranow, and Jack are also given.

K. L. VEHLE.

Beasesen, A. N.: A Simple Operation for Retroversion of the Uterus. *Am. J. Surg.*, 1917, xxxi, 9.

A simplified method of correcting retroversion of the uterus has been tried by the author in a number of cases with entire satisfaction.

His modification of Dudley's method which appeared in the *American Journal of the Medical Sciences* for June, 1906, is given in detail.

The operation is done intra-abdominally, using non-absorbent suture material or chromic catgut. An ordinary needle is passed through the left round ligament about half an inch distal to the uterus. From that point a purse-string suture is run through the round ligament to the internal ring, where the needle takes a bite through the tissues of the ring, and a return purse-string is run back through the round ligament to the point of starting. The round ligament on the right side is treated in the same manner. When the operator draws taut the suture of one side and his assistant draws taut the suture of the opposite side, it is easily determined how much tension will be required to bring the uterus into the corrected, or rather, over-corrected position. The sutures are then tied. If desired, a shortening of the uterosacral ligaments can be performed to give added security.

The operation aims at retaining the strongest part of the round ligament to functionate. The thinner outer part is crumpled on itself in such manner that it is made thicker and of equal strength with the uterine end of the round ligament. The uterus is thus held in a normal position and supported by its round ligament in a natural way. There are no loops or holes for the intestines to enter and cause trouble. Should pregnancy occur the uterus is free to move and rise as may be required.

Kahle, R. R.: Uterine Rupture Following Anterior Hysterotomy. *J. Am. M. Ass.*, 1917, lxi, 2179.

The patient, aged 21, had been well until a miscarriage at three months occurred in December, 1915. At that time, in order that hemorrhage following fetal expulsion might be arrested, the abdomen

was opened, the uterus incised, and the offending placenta removed. Operative recovery was prompt.

Eighteen months later the patient came to labor at full term. Mild labor pains appeared irregularly for about forty-eight hours. The pulse was rapid, but of good volume. Gastric dilatation was in evidence. There were no fetal heart sounds. Profound shock was absent and the patient said that she felt quite well. The uterus and fetus could not be separately palpated through the abdominal wall.

A dead fetus was removed from the peritoneal cavity, hysterectomy was rapidly performed, and a quart of physiologic sodium chloride solution administered intravenously. An uninterrupted recovery followed.

Examination of the uterus revealed that it had yielded at the old hysterotomy scar.

EDWARD L. CORNELL.

ADNEXAL AND PERIUTERINE CONDITIONS

Gellhorn, G.: Unilateral Defect of Tube and Ovary; a Study in Prenatal Pathology. *Am. J. Obst.*, N. Y., 1917, lxxvi, 878.

The author reports the interesting case of a nineteen-year-old nullipara in whom, during a laparotomy, the total absence of the left tube and ovary and of the left broad ligament was accidentally discovered. The uterus possessed perfectly normal configuration. The right adnexa were inserted at the uterine horn. The sexual characteristics were otherwise normally developed. Chromocystoscopy revealed the absence of an ureteral opening on the left side which suggested absence of the left kidney.

This case leads Gellhorn to discuss the variations in congenital and acquired defects and their differences. In a congenital or primary aplasia of one tube and ovary, the uterus has the characteristic form of the uterus unicornis, an elongated and spindle-shaped organ which leans toward the side where the adnexa are present. On the other hand, if the uterus is of normal shape, as in the case reported, aplasia of one tube and ovary must be considered a primary defect; that is, acquired in antenatal life. The etiologic factors are either torsion

of the adnexa or fetal inflammation. The few cases thus far recorded in the literature are reviewed; in none of them is the defect as complete as in Gellhorn's case.

CAREY COLBERTSON.

MISCELLANEOUS

Griffith, F. W.: Some of the Common Errors in Gynecology. *South. M. J.*, 1918, xi, 40.

The author deals with those conditions which are frequently met by the general practitioner. He strongly urges physicians to avoid vaginal examinations on virginal women and to become more familiar with the rectal examination.

In his opinion the tampon is used entirely too frequently and it is apparently so used for the control of hemorrhage incident to pregnancy or the puerperium, as a means of applying medicines in inflammatory conditions, and as a test of the probable benefit of an operation for displaced uterus. Chronic endometritis is relatively rare, while chronic endocervicitis is quite common.

He recommends local measures, such as the actual cautery, for the eradication of infection in the cervix, but condemns its application to the body of the uterus. While the diagnosis of ulceration of the cervix is frequently made, it is usually an incorrect one. There is frequently an eversion of the cervix so that the observer really sees the normal mucous membrane of the canal. This gives an angry appearance to which he applies a caustic. There is then a proliferation of cells and the ulcer is said to be cured. Soon these cells desquamate, the ulcer is said to have recurred, and the patient is put through the same treatment again. Such eversions if left alone will seldom cause trouble and the patient will be saved unnecessary worry and expense.

The author emphasizes the fact that in a patient past thirty-five, unusual bleeding or discharge is not due to the menopause, but is presumptive evidence of cancer, until proven otherwise. He states that retroflexion of the uterus *per se* is not an indication for operation, and even recommends that when in a routine examination a symptomless displacement is found, the patient should be kept in blissful ignorance of it. He urges that the practitioner should get away from the idea that most nervousness, headaches and obscure pains are due to the pelvic organs.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Thoenen, F.: A New Specific Serum Reaction for the Diagnosis of Pregnancy. *München med. Wochenschr.*, 1917, No. 24.

Thoenen of the Obstetrical Clinic of Berne gives a new reaction in pregnancy. For this a preparation is used which consists of a combination of placenta with iron. It is manufactured in Berne and gives a specific reaction with the blood serum during pregnancy. A centigram of the preparation is placed in a sterile test tube. To this is added a centimeter of serum. After three hours the mixture is filtered and washed in distilled water. To the filtrate is added twenty drops of 18 per cent hydrochloric acid and an equal amount of an aqueous solution of 50 per cent ferrocyanide of potassium and shaken up with 2 ccm. of ether. A positive reaction gives a decided reddish color; the reaction of control remains uncolored or shows only a tendency toward red.

A first series of trials gave 94 per cent of correct results. In another series the author obtained 98 per cent of correct results. In all controls negative results were obtained. Even in pathologic conditions when the Abderhalden method sometimes gave positive reactions, the author by his method claims to have obtained negative results. Thus in the controls with negative results there were 17 cases of adnexal disease, and 9 cases of tumor, 7 of them carcinoma.

W. A. BRENNAN.

Heineck, A. P.: Double, Recurrent and Bilateral Tubal Pregnancies; an Analysis of 89 Cases Reported in the Literature and 3 Unpublished Personal Cases. *Illinois M. J.*, 1918, xxxii, 1.

The author has collected, studied and analyzed all cases of double and bilateral tubal pregnancies reported with sufficient data in the English, French, and German literature from 1908 to 1916 inclusive.

Double tubal pregnancies are almost invariably bilateral, exceptionally unilateral. Double and bilateral tubal pregnancies are either simultaneous or recurrent. They can occur at any period of the child-bearing age.

One ectopic pregnancy is not necessarily followed by another ectopic pregnancy. Normal pregnancies may be sandwiched in between two extra-uterine gestations. Months, or even years, may elapse between the incidence of pregnancy in one tube and the lodgment of an impregnated ovum in the opposite tube. In the collected cases the interval between the two tubal gestations varied from three months to nine years.

Double, recurrent and bilateral tubal pregnancies occurred in women who had never borne living children.

The cause of tubal pregnancy, whether single, double or recurrent, is not definitely known. Inflammatory and other degenerate changes of the tubal wall do not possess the important etiological rôle formerly attributed to them. It has been believed that the predominant cause of tubal pregnancy is salpingitis, postabortion, postpartum or gonorrheal in nature, with resulting destruction of the tubal ciliated epithelium.

All the collected and personal cases were primarily either interstitial, isthmic or ampullary. All the others were bilateral. These 92 cases represent 185 tubal gestations. Not one of these pregnancies, either first or second, went to full term. Sixteen gestations were subjected to operative relief previous to tubal abortion or tubal rupture.

Rupture, extratubal, occurs at or near the placental site, taking place either into the peritoneal cavity or between the folds of the broad ligament. Bilateral tubal gestation may terminate in tubal rupture in one tube and in tubal abortion in the other.

Tubal abortion and tubal rupture, be the latter intra- or extratubal, are associated with moderate or profuse internal hæmorrhage, either in the lumen of the fallopian tube between the folds of the broad ligament or into the peritoneal cavity.

When hæmorrhage takes place into the free peritoneal cavity, a practically limitless space, the patient may bleed to death without a drop of blood appearing externally.

The treatment of ectopic gestation previous to, at time of, or after tubal rupture or abortion is operative.

It is not justifiable to sterilize a woman just because she has had a tubal gestation. Remove the unaffected tube:

1. If there be existing in the patient some constitutional state contra-indicating pregnancy, such as epilepsy, alcoholism, the worst types of neurasthenia, syphilis, mental disease, imbecility, advanced tuberculosis, advanced cardiac, renal or hepatic disease, bad types of primary anemia.

2. If there be existing in the patient some pelvic deformity preventing delivery of a viable fetus through the maternal passages.

3. If it be imbedded in adhesions, if it be malformed or the seat of a congenital anomaly or of inflammatory, neoplastic or other degenerative changes; hydrosalpinx, pyosalpinx, etc.

The mortality of bilateral tubal pregnancy, skillfully operated upon, is very low. It should be

nil. In the collected cases there were only three deaths, two from peritonitis and ileus and one from peritoneal hemorrhage. EDWARD L. CORSELL.

Maldonado, J. A.: Abdominal Cesarean Section and Subtotal Hysterectomy for Contracted Pelvis with Eclampsia (Cesarea abdominal e histerectomía subtotal post estrchez pélvica y eclampsia). *Crón. med.* Lima, 1917, XXIV, 419.

Maldonado's case was that of a primipara of twenty-two with an infantile pelvis in whom labor was impossible by the natural route. While she was under observation in the clinic three attacks of eclampsia occurred. Laparotomy and abdominal cesarean section was done, followed by subtotal hysterectomy and vaginal drainage. The fetus was somewhat asphyxiated but was revived. It was normal in dimension and weight. The same day upon which she was operated, the patient had three more attacks of eclampsia.

Mother and child left the hospital in perfect condition. M. A. BERNSTEIN.

Huntington, J. L.: Certain Causes of Bleeding During Pregnancy; Their Significance and Treatment. *Intern. M. J.*, 1917, XXIV, 1161.

Huntington calls attention to the fact that bleeding at any time during the course of pregnancy is a symptom which may be of gravest import. It is a condition that demands intelligent and rapid action on the part of the obstetrician in charge, and should he be not able to cope with the situation at hand, consultation should be demanded without delay. The conditions causing hemorrhage during pregnancy discussed by the author are:

1. Extra uterine pregnancy.
2. Threatened abortion.
3. Placenta prævia
4. Premature separation of a normally implanted placenta.

The treatment of ectopic gestation, once the diagnosis is made, is operation.

In the threatened abortion cases the author recommends curettage as a routine, unless one can be sure that the ovum and secundines have been expelled. In the fifth and sixth months curettage is not so necessary, for then one can with more certainty ascertain just what has been expelled.

In placenta prævia, accouchement forcé, bipolar version, Voorbees' bags, vaginal and abdominal cesarean section are the methods recommended. Accouchement forcé can only be used in those cases where considerable dilatation has already been obtained. The danger of disabling lacerations of the cervix and lower uterine segment are great. Bipolar version is perhaps the best procedure for the general practitioner. It has high fetal mortality, but is safest for the mother. The insertion of a Voorbees bag is simpler than bipolar version and offers a better chance for the baby. Vaginal cesarean section has a narrow field in placenta prævia and should rarely, if ever, be done. Abdominal cesarean sec-

tion is indicated in all primipara and in certain multipara who are not in labor, provided no infection be present.

In ablatio placenta in multipara with soft cervix, delivery by the vaginal route by any method indicated is the proper procedure. If severe toxic symptoms are present, abdominal cesarean may be indicated. In primipara, unless dilatation can be effected rapidly and easily, abdominal cesarean is the method of choice.

Hysterectomy may also be indicated in any case where, due to an atonic condition of the uterus, hemorrhage persists. H. B. MATTHEWS.

Hirst, B. C.: The Diagnosis, Treatment and Management of Surgical Conditions Complicating the Process of Generation. *Am. J. Obst.*, N. Y., 1917, LXXVI, 971.

Hirst relates some interesting conditions in pregnant women encountered during his hospital work in Philadelphia. He refers to the unfavorable results in plastic work, particularly that done in special operations on women.

The case in point was one of conglutination of the external os resulting from an operation for lacerated cervix. Hirst says that it is perfectly easy to deal with these cases of conglutination of the external os by an incision in the overdilated lower uterine segment, the center of the crucial incision corresponding to the site of the external os.

W. A. BRENNAN.

Bainbridge, W. S.: The Influence of Pregnancy on the Development, Progress, and Recurrence of Cancer. *Am. J. Obst.*, N. Y., 1918, LXXVII, 51.

Bainbridge reports two cases, one a recurrent carcinoma following cancer of the breast, the other a sarcoma of the lower eyelid and superior maxilla, both occurring as complications of pregnancy. The clinical and experimental literature is then reviewed briefly and the following conclusions are set forth:

1. Pregnancy increases the rapidity of growth of co-existent spontaneous cancer.
2. If, as some contend, there is a retardation of the malignant process during gestation, the significance of this should not be misunderstood. Rapid increase of growth may follow delivery.
3. While the stimulating effect of pregnancy is exerted more markedly upon the organs more directly concerned with the pregnant state, cancer in any other part of the body may be influenced in like manner.
4. If the cancer is removable, in order to secure the best chance of permanent cure, the pregnancy should be terminated, regardless of any consideration for the child.
5. Even in advanced cases of malignant disease, in which there is no hope of cure for the mother, it is a question whether she should not be given a chance of prolongation of life and, more important, a mollification of suffering which abortion may give.

CAREY CURRIEYSON.

LABOR AND ITS COMPLICATIONS

Morinelli, V.: Infarcts of the Placenta; Contribution to their Study (*Infartos de placenta; contribucion a su estudio*). *Semana med.*, Buenos Aires, 1917, XLIV, 360.

The author reaches the following conclusions:

1. Subchorionic infarcts are very frequent. They have been observed in 60 per cent of placentas taken at random.

2. The author thinks that they are produced by an alteration in the basal chorion; hence they depend on the age of the placenta. This explains their frequency and their harmlessness for *feto-placental* development.

3. White nodular infarcts are observed in 15 per cent of placentas. They correspond to alterations of the synetium following slight endometritis. Unless the number of infarcts is very large they produce no appreciable alteration in the *feto-placental* relations.

4. That infarcts have no influence in the production of abortion is evident since they are most frequent in the later months when abortion is less frequent.

5. White infarcts influence the detachment of the placenta by favoring hemorrhage after birth.

6. The more important affections, syphilis, tuberculosis, etc., have no direct influence in the production of white infarcts.

7. Clinically white subchorionic infarcts have no importance, but nodular infarcts show the existence of a decidual endometritis. W. A. BRENNAN.

Roberts, C. H., and Stevens, T. G.: Twilight Sleep in Childbirth. *Med. Press & Circ.*, 1917, CIV, 471.

Roberts and Stevens report on 67 cases of twilight sleep at Queen Charlotte's Hospital. In 90 per cent of the cases the pains were diminished; 46.2 per cent had complete amnesia; 44.7 per cent had partial amnesia. Analgesia was complete in 32 cases; partial in 31. There were 2 complete failures.

The puerperium in their 67 cases was uneventful. Involution was not retarded. There were 12 forceps cases, every one of which was due to an obstetric complication not dependent upon twilight sleep. The placenta was spontaneously expelled in 65 of the 67 cases. There were 2 postpartum hemorrhages, but one was due to an adherent placenta and the other to a low implanted succenturiate placenta. Fifty-three babies breathed or cried spontaneously. Thirteen babies cried after moderate resuscitation. Three babies died. Two were premature and one died of bronchopneumonia on the sixth day. Of 64 living babies who left the hospital, 49 were breast fed. Whether twilight sleep affected lactation or not the authors could not say.

Considerable experience is required by the obstetrician, as well as the nurse, for the successful administration of morphine-scopolamine. Furthermore, every case of twilight sleep demands the constant attendance of a doctor. H. B. MATTHEWS.

Weiz, W. E.: Eutocia Attained by Rational Methods Rather Than by Excessive Narcosis During Labor. *J. Mich. St. M. Soc.*, 1917, xvi, 501.

While fully in sympathy with the use of narcosis to relieve pain incident to uterine contractions, the author believes that recently attention has been focused upon this question to the neglect of equally important features of obstetrical care. Some of the neglected measures, because they tend to establish the patient's confidence, actually have the effect of making her less sensitive to pain.

The author argues convincingly that conscientious medical supervision during pregnancy not only places the physician in a position to treat his patient most intelligently at the time of labor, but imbues her with a degree of faith in the successful issue of her case. And this means greater fortitude for the hours while labor is actually in progress. A knowledge of the salient features of parturition has a similar influence. An intelligent view of the reproductive process, therefore, serves not only to secure the peace of mind of the prospective mother but also to promote the comfort of the parturient woman. Another argument in addition to those commonly advanced in support of conscientious prenatal care is briefly to the effect that an element of mental suggestion attends the medical supervision of pregnancy and this element tends to reduce the suffering of childbirth. J. M. SLEMONS.

Harrar, J. A.: The Causes of Death in Childbirth; Maternal Mortalities in 100,000 Confinements at the New York Lying-In Hospital. *Am. J. Obst.*, N. Y., 1918, lxxvii, 38.

Harrar's contribution is a brief one confined chiefly to statistics from the records of the New York Lying-In Hospital. Since the establishment of the service in 1890, 101,197 confinements, both outdoor and indoor, have been cared for, and it is with the mortalities of these that the paper deals. In the outdoor service are counted 60,081 confinements of which 218 women died. Of these, 137 died in their homes and 81 after transfer to wards of the Lying-In or other hospitals. The full maternal mortality of the tenement service, 218, represents one death in every 317 women confined or 0.31 per cent mortality. In the last eight years this mortality has fallen from one death in every 312 confinements to one in every 326 confinements.

Of the 25,130 regular indoor applicants confined, 100 died, one in every 212 confinements or 0.47 per cent. This higher mortality is attributed to the greater proportion of primiparæ in the indoor service, 48 out of every 100 patients as compared with 30 primiparæ out of every 100 labors in the tenement service. The death rate rises tremendously in the emergency cases confined in the hospital, 463 deaths, or 5 per cent.

Harrar regards these death rates as low but finds it disconcerting to discover that, even in these selected groups, the predominating cause of death is

puerperal infection. Of the 23,130 regular indoor patients, 23 died, or 0.95 per thousand; of the 69,081 outdoor patients, 39 died, or 0.85 per thousand. One-third of the deaths occurring among the postpartum admissions and emergency labors handled by a succession of midwives and doctors before admission were due to sepsis. Eclampsia ranks second as a cause of death, ten among the indoor patients, 0.43 per thousand; twenty-six in the outdoor service, 0.37 per thousand.

Peritonitis following caesarean section occurred 13 times in the indoor service and 3 times in the outdoor service. Placenta prævia caused 5 deaths among the indoor patients and 25 among the outdoor patients, 0.20 per thousand and 0.36 per thousand, respectively. Five deaths were due to ruptured uterus, indoor service, and 20 deaths, outdoor service, or 0.26 and 0.28 per thousand, respectively.

Nephritis, broken cardiac compensation, pneumonia, shock, and exhaustion rank next in frequency. Then come shock and hemorrhage after caesarean section, tuberculosis, acute toxæmia of pregnancy, and accidental hemorrhage. Abdominal pregnancy, rupture of the vaginal vault, pulmonary embolism and thrombosis, cerebral hemorrhage, appendicitis, suicide in acute mania, carcinomatosis, brain tumor, sarcoma of the liver, ether and chloroform narcosis constitute the lesser causes. About one-tenth of one per cent of the total mortality consisted in sudden deaths of unknown causes, most of them apparently pulmonary embolism, but not verified by autopsy. CAREY CULBERTSON.

MISCELLANEOUS

De Normandie, R. L.: *Obstetrics*. Boston M. & S. J., 1913, clxviii, 76.

The author makes a strong plea for prenatal care from the earliest possible period of pregnancy in order to forestall the complications that may occur. By carefully examining and watching the pregnant woman and regulating her life as to diet, hygiene and medication, the mortality and morbidity among mothers and infants will be greatly reduced. Accidents of pregnancy and labor can not be entirely prevented, but may be greatly reduced.

A thorough physical and vaginal examination should be made as soon as the patient presents herself. In case of a badly damaged heart or kidney, an early abortion can be done. In retroversion of the uterus where the cervix is high up in the pelvis, just at, or behind the symphysis, and the fundus in complete retroversion, incarceration of the growing uterus will follow. This type should be corrected and a pessary inserted to hold the uterus until it cannot fall back. In milder cases the knee-chest position will facilitate the return to proper position of the retroverted organ. Coitus is in some cases a cause of miscarriage.

Up to the seventh month the patient is seen once

a month and the urine examined likewise. After the seventh month the patient is seen once in two or three weeks, and the urine examined every week or ten days. With the urine normal and blood pressure staying under 130 mm. of mercury there is but little danger of toxæmia. The fulminating type may occur very suddenly, but is exceedingly rare. The great majority of eclamptic cases are preceded by premonitory symptoms and can be avoided. A rise in blood-pressure is of marked significance.

Bleeding, no matter how slight, during gestation demands immediate attention. Bleeding in the latter months is probably due to some type of placenta prævia, but it is questionable whether an immediate vaginal examination is indicated. Unless the physician is prepared to meet the hemorrhage that may follow, it is best not to make examination. The author records a case in which the patient died within an hour after her physician started a severe hemorrhage on examination, not being well prepared to cope with it.

The relative size of the fetal head to the inlet is of importance. This can be determined by measurement, and particularly palpation. The inlet is more commonly contracted than the outlet. In the majority of cases there is no disproportion between the head and pelvis, but if it is markedly present, a caesarean section can be done on an elected date. In the border-line cases a test of six or eight hours of good labor will often bring about a normal delivery. If a caesarean is necessary, the risk of waiting a few hours with no vaginal manipulation is not great. While the author is not opposed to caesarean section when necessary, he feels that the present tendency is too much toward this procedure in cases which could be treated otherwise.

Throughout labor watchfulness is essential. Vaginal examinations should be avoided, or only one under the strictest antiseptic precautions. Rectal examinations are of help, though they should not be used in the presence of hemorrhoids. The condition of the uterus with regard to normal contractions and relaxations should be watched; also the fetal heart sounds. Especially is the danger to the child great after the second stage. Postpartum hemorrhage should be guarded against by careful attention to the separation of the placenta. If there is no bleeding, it is best to wait for normal separation. Adherent placenta is very rare, but when it occurs, manual emptying of the uterus is required. The physician should not leave the patient until the uterus is well contracted.

The figures given by the census in 1913 showed that in the United States 15,376 deaths were due to childbirth, and 6,077 of these were due to sepsis. Comparison of death rates from fifteen foreign countries with the United States shows that the latter stands fourteenth in the list, only two countries, Switzerland and Spain, showing a higher rate. Sweden, Norway and Italy show the lowest rates.

The author asks for the development of an "ob-

stetric conscience" in the physician with proper surgical training to meet the obstetrical requirements.

L. R. GOLDSMITH.

Van Eman, F. T.: *An Obstetric Résumé*. *J. Missouri St. M. Ass.*, 1912, XIV, 503.

In a very comprehensive résumé of obstetrics, Van Eman has considered (1) normal cases with special reference to prenatal and postnatal care; (2) abnormal cases, with reference to various methods of delivery, both by the natural channel and otherwise; (3) the use of pituitary extract; (4) the conduction of the third stage of labor; (5) the conduction of the puerperium; (6) the management of the toxemias; (7) the management of placental abnormalities prior to labor; (8) the relations of the patient to the accoucheur.

Normal cases naturally take care of themselves and the less interference is done, the better for all parties concerned.

Breech, face and transverse cases may be handled according to the methods laid down by the authoritative obstetricians, as all are pretty well agreed as to the best procedure in such cases. However, the proper management of occiput posterior is still an unsettled question. The author favors pushing up the head and by the combined manipulation rotating the head into the anterior position. When the head is firmly impacted, craniotomy is indicated in the interest of the mother. For obvious reasons, cesarean is usually out of the question.

The dictum, "once a cesarean always a cesarean," the author believes, is worthy of the most serious consideration. Certain cases of placenta prævia,

abruptio placenta and eclampsia offer an indication for cesarean section and the author prefers early section to the prolonged mutilating vaginal procedures for such conditions.

A word of warning is sounded regarding pituitary extract. Small doses often repeated are far preferable to one or more large doses. Three minims repeated three or four times during the first stage of labor is recommended.

In the conduct of the third stage of labor the author is in favor of removing the placenta if after the usual time and after failure of the Credé maneuver it does not come away.

If the asepsis is perfect and the hands are properly gloved and sterile, there should be no danger in manually removing the placenta. It is vastly safer for the patient than leaving the placenta inside the uterus.

"The best way to treat eclampsia is to prevent it," expresses the author's views upon this subject. Prenatal care should eliminate the occurrence of any real cases of eclampsia.

Placental abnormalities prior to labor are serious obstetric complications, and there is no "watchful expectancy" treatment. Once the diagnosis of placenta prævia or abruptio placenta is made, pregnancy should be terminated. Cesarean section is certainly indicated in selected cases of placenta prævia and abruptio placenta.

In conclusion, the author makes a plea for better obstetrics and better fees, and offers the suggestion that "the surest and quickest way to raise the standards of obstetrics is to raise the fee for the work."

H. B. MATTHEWS.

GENTO-URINARY SURGERY

KIDNEY AND URETER

Burns, J. E.: A New Method for Locating Small Calculi in the Kidney at Operation. *J. Urol.*, 1917, 4, 339.

Sometimes great difficulty is experienced after exposure of a kidney in locating a small calculus, with consequent mutilation and irreparable damage to the kidney parenchyma. Splitting of the kidney increases the possibility of postoperative hæmorrhage.

The author has devised a method for accurate location of the stone. The prime essential is to have satisfactory roentgenograms. After exposure of the kidney, the plain roentgenogram is examined and by means of a straight liver needle or fine probe the operator measures off the distance from the shadow of the stone to the border of the pole of the kidney. This measurement is then transferred to the surface of the kidney. The same method is then employed in mapping out the distance of the stone from the convex border of the kidney. These two points should coincide and a needle inserted perpendicular to the surface of the kidney at this point should in its passage through the kidney come in contact with the stone.

H. W. PLAGEMAYER.

Castano, E.: Calculus Anuria in a Solitary Kidney (*Anuria calculosa en un riñon único*). *Rev. Asoc. méd. argent.*, Buenos Aires, 1917, XXVII, 423.

In a man of 50 years with symptoms of renal lithiasis, the author made a pyelotomy. The left kidney was found enlarged, with an abundance of purulent urine in the pelvis. It was not possible to locate a stone in the kidney. The next day a small stone was found in the ureteral orifice which was spontaneously discharged. All attempts to obtain urine from the right side had failed, nor could any ureteral orifice be found by instrumentation or cystoscopy on this side.

During the first eight days after operation urine was discharged through the wound. On the ninth day it was possible to pass a sound in the left ureter and purulent urine was obtained. Afterward the urination was spontaneous through this ureter. The wound was completely closed forty days after intervention. Clinical tests satisfied the author that the right kidney was absent, due to a congenital cause.

W. A. BRENNAN.

MacGowan, G.: Exfoliative Cystitis. *Canad. St. J. Med.*, 1918, XVI, 71.

Exfoliative cystitis is a pathological process apparently arising in the course of vesical infection

without any consistently definite or specific cause, though passive congestion with ammoniacal decomposition of the urine is present. It is much like an exfoliative dermatitis, but unlike the latter, accompanied by suppuration. There is bloody, foul, and purulent urine, increased frequency of micturition, irregular retention, and passage of gravel preceding the exfoliation. The capacity of the viscus is permanently diminished, and hence frequent urination is the rule in those cases that recover. The disease is much more common in females than in males, and has often been noticed as following passive congestion of the vesical mucosa in displacements and retroversion of the gravid uterus. In the male it has sometimes seemed to follow unclean instrumentation.

The author quotes a case in a woman where cystoscopic examination showed a dirty membrane coating all parts of the bladder mucosa, concealing the ureteral meatus, and from the vault hung many shreds "like stalactites in a cave."

The treatment of these cases is by reposition of the displaced uterus in the knee-chest position. The author has traced the occurrence of moderate grades of chronic cystitis to pressure of a prolapsed stomach and colon and has cured cases by posture and abdominal support.

In the presence of retained urine, an indwelling De Pezzer or Malecot catheter should be used and the bladder cleansed frequently with one of the usual mild agents, while at the same time the kidneys should be kept active under forced water and moderate doses of benzoate of soda given to insure an acid urine being poured into the kidney pelvis. The bladder should be examined from time to time with an operative cystoscope and any loose membrane removed through it. Oil of sandalwood and hexamethylenamine are useful, once the membrane has loosened itself. If diphtheria were shown to be the cause, or a pseudo-diphtheria, the use of antitoxin would certainly seem rational. Vaccines have doubtful values. Cystotomy may be necessary for drainage. General hygienic measures, good food and a continuous vesical toilette are the measures best suited for obtaining relief.

In literature the mortality is from 20 to 25 per cent, and complete restoration of vesical comfort is unusual.

The author cites a case of membranous cystitis seen in consultation. The patient while recovering from a severe type of pneumonia was attacked with a severe cystitis. Examination showed continuous incontinence, and a residual very foul urine of about 50 ccm. A culture made from this grew a perfectly pure colon bacillus. An operating cysto-

scope located a number of loose pieces of membrane, together with a calculus which was crushed and removed. An ureteral catheter was passed into both ureters which were dilated. The urine of both sides was cloudy. Microscopical examination showed a little pus and a few colon bacilli on the right side, and on the left considerable pus, epithelium, debris, urates, indigo, and an occasional red blood-cell. She had hydronephrosis of both kidneys. The pelvis of both kidneys were washed out with a one-fifth per cent solution of silver nitrate.

A vaccine was prepared from the culture and the initial injection of 25,000,000 given at intervals of five days; the quantity was increased until it was 150,000,000. The bladder was cleansed twice daily by irrigation with mild antiseptic solution. Dribbling ceased and she regained vesical consciousness, but there was some residual urine; this disappeared following lavage of the kidney pelvis with 5 per cent silver nitrate. Her general condition has much improved but the bladder capacity has never exceeded 100 ccm.

THEO. DROZDOWITZ.

Buerger, L.: Three Unusual Cases of Renal Tuberculosis. *N. E. M. J.*, 1915, cvii, 6.

Buerger calls attention to the difficulty which may be encountered in diagnosing, at the time of the operation, tuberculous lesions of the kidney. He reports three such cases. In the first, bacilli of tuberculosis were isolated from the urine, there were characteristic symptoms of tuberculosis, and yet the kidney, even after removal, was practically normal to the eye. Only after several sections had been made through various parts of the kidney were ulcerative, cheesy lesions found involving one of the calyces. The ureter was in this instance markedly thickened.

A second case in which the parenchyma at the time of operation showed no change whatsoever showed, however, induration about one of the papillae and near it a small oval ulcer of irregular contour with a slightly hæmorrhagic base. Elsewhere the pelvis seemed normal. This case illustrates an early case of tuberculosis of the kidney with no signs of involvement of the parenchyma, with dissemination of the process by way of the pelvic mucosa, rather than upward into the cortex or pyramids.

The third case was one in which a solitary papilla was markedly involved, with involvement of the wall of the calyx. Externally there was no evidence of tuberculosis nor did casual inspection of the bisected specimen reveal it.

J. S. EISENSTAEDT.

Geisinger, J. F.: Renal Infection. *Am. J. M. Sc.*, 1917, cliv, 883.

Geisinger gives an analytical report of 80 instances of non-tuberculous renal infection. Fifty-four per cent of these cases studied bacteriologically harbor some member of the colon bacillus group, 34 per cent staphylococci and streptococci, while 16 per cent are mixed infections and give evidence that the

colon bacillus is a secondary invader. Only one half of the series was studied bacteriologically.

The author considers that direct ureteral ascending infection occurs in very few cases, the lymph channel not commonly, while the hæmatogenous route is the method in a vast preponderance of cases.

He considers the coccus infections to be more severe, resulting in surgical complications more frequently and presenting a symptomatology not unlike that produced by the colon bacillus infections, but more severe. Blood cultures may be positive in either type of infection.

The coccus infection involving the cortex and that portion of the kidney distant from the pelvis, and not particularly concerned in the elimination of phenolphthalein, produces little or no microscopic changes in the urine or change of the functional capacity of the kidney as determined by the dye output.

With bacillary infections, however, the pelvis and convoluted tubules being primarily involved, pus, kidney elements and bacteria appear in the urine and the function is profoundly affected. Geisinger believes that most infections are bilateral.

Thirty per cent of his cases presented no etiology, 20 per cent had a chronic constipation, pre-existing foci occurred in 10 per cent, while anomalies and pre-existing pathology of the kidney were noted in 13 of the 80 cases studied.

In 70 per cent the infection was bilateral, the unilateral cases being either of the septic infarct type of infection, or presenting some pathology which interfered directly with the vitality of the kidney, such as strictured ureter, third pelvis, stone in the pelvis or ureter, mobility, or kink. In the bilateral cases, however, the infection is commonly predominant on one side.

The first symptom was pain in 46 per cent of the cases; bladder disturbance, 32 per cent; fever, 6 per cent; vomiting, 4 per cent; general weakness, 2 per cent.

Bladder disturbance occurred in 86 per cent of the cases; 77 per cent had pain of varying degree, usually over the lumbar region, but sometimes over the bladder, throughout the entire abdomen, under the costal arches, in the inguinal region, and across the sacrum.

Chills and fever were present in 54 per cent; gastro-intestinal disturbances, 43 per cent; malaise, 40 per cent; pyuria was present in all but one instance and that a perinephritic infection; hæmaturia was present in 10 per cent.

Renal function tests are so variable that they are hardly reliable in giving a prognosis.

Forty per cent of the bladders are normal cystoscopically, while the others vary from congestion of the trigone to marked generalized cystitis.

As to the treatment, such conditions as perinephritic abscess, pyonephrosis and infected stone must be dealt with surgically according to the circumstances, while stricture of the ureter will have to be dilated cystoscopically.

Cases without gross complications demand individual decisions as to treatment. Surgery should only be used as a last resort; such kidneys often have a marked reactive power, and such should always be considered. Geisinger refuses to recommend anything more serious than pelvic lavage in these cases until that procedure has been tried.

For chronic bacillary infections and others not of the fulminating type, the most valuable internal medication consists of draughts of pure water. Antiseptic drugs are disappointing, especially the formaldehyde-carrying drugs. He suggests that methylene blue and quinine be tried.

Vaccines are disappointing as used by Geisinger, while the treatment of most value is pelvic lavage. He does not agree with the idea that ureteral catheterization dislodges infected masses and thereby causes drainage, which is the sole benefit produced by a pelvic lavage.

For lavage either silver nitrate or formaldehyde is used, the silver nitrate being the most effective, used in 1 per cent solution; he finds this as effective as stronger percentages.

Certain chronic infections cannot be completely removed by lavage or by anything but surgical removal; however, temporary improvement can always be had by lavage, so that by previous treatments the infection can be held under control.

HARRY CULVER.

Tenney, B.: The Recognition of Surgical Kidney.
Boston M. & S. J., 1918, clxxviii, 44.

Surgical kidneys are those whose symptoms can be relieved or cured by mechanical means. With some pathological conditions which fit into this group there may be a presurgical state where the course of the disease may be favorably influenced.

Proper interpretation of symptoms suggestive of surgical disease in the upper urinary tract is not always easy. Concealed by vague and misleading descriptions they are labeled pelvic, orthopedic or digestive when they belong to the urinary tract.

All agree that urinary stone, cancer of the kidney, and hydronephrosis are surgical conditions, also renal tuberculosis. There is less agreement about pyelitis. The symptoms which may turn attention to the urinary tract are frequent urination, blood or pus in the bladder urine, urgency or incontinence, and tenesmus.

If associated with these, recurring pain or discomfort in the loin may suggest trouble above the bladder. Variable temperature, loss of weight and the presence of albumin are additionally suggestive.

Frequency depends upon the relation of working bladder capacity to kidney excretion. The pressure of a tumor outside the bladder or increased pull of the ureter will diminish the working bladder capacity more or less according to posture or activity.

The presence of pus or blood in bladder urine is most important, but the source is sometimes difficult to locate. The presence of either is more a serious symptom than moderate frequency, and the

three combined more serious yet. The probability of stones, tuberculosis, or new-growth increases with the length of time this combination exists.

Incontinence without urgency implies a weak sphincter from injury or disease. Urgency seems to be associated with irritation of the trigone or the lower ureteral fibers. Tenesmus is a further exaggeration of urgency, continuing after the bladder is emptied of fluid.

Kidney diseases are painless unless there is obstruction to the flow of urine. Unilateral pain is a symptom of stone when the stone blocks the ureter, of tuberculosis and cancer when a clot is passing down or intermittent hydronephrosis when the ureter is kinked, and of acute infections when there are multiple retentions of urine within the kidney substance.

Variable temperature is common. In acute infections it may be high and in old infection subnormal or variable.

Loss of weight corresponds with pain, loss of sleep and lack of appetite.

Cystoscopy, study of separate urines by microscope and color test, guinea-pig inoculation, and X-ray examination may all be required for complete diagnosis.

The conditions under which these symptoms may develop are pyelitis, hydronephrosis, stone, tuberculosis and cancer of the kidney, also pyonephrosis and acute hemorrhagic nephritis. Most of these are associated with infection and the cause and path of the infection are important.

When the equilibrium between intake and increase of bacteria and their excretion or destruction is upset, health failure occurs. Pressure upon the renal vessels by inflammation or adhesions may result in disturbed renal function. Ligation of the ureter produces marked venous congestion and slowing of the blood stream. If active bacteria are present in the blood stream a septic thrombus results which may become the calcified nucleus of a stone, the beginning of a pyonephrosis, or it may disappear.

With intermittent ureteral obstruction one may assume a lesser degree of the same anatomical changes, and the bacteria, white and red blood-cells, and round cells give the sediment picture of pyelitis. With virulent bacteria present, a more acute general reaction with high temperature, acute pain, and prostration may occur, with the sediment of acute hemorrhagic nephritis.

"Hydronephrosis" is applied to all cases where pain is caused by retention of urine in the pelvis.

A half-ounce may cause severe pain in one case, while another may tolerate a pint. Much of the knowledge of the smaller hydronephrosis is obtained by pyelography. Absence of one-sided pain in a recumbent position and its reappearance a half-hour after arising is a suggestive symptom, and more common than repeated urination after lying down.

Kidney stones cause pain only when the ureter is blocked, and stone in the ureter may cause reflex irritation but not much pain unless it obstructs.

X-ray plates have shown many unsuspected stones and have also failed to detect some that were present.

It is usually possible to diagnose renal or ureteral stones, though not always; but it is always possible to diagnose renal obstruction.

Renal tuberculosis should be recognized earlier than it is. A swollen epididymis may be the earliest sign. Others may have albuminuria, urinary frequency, hæmaturia or recurrent periods of acute bladder symptoms. Early diagnosis of renal tuberculosis is possible except under two conditions, i.e., if the urine is collected when no bacilli are coming through, or if the ureter is blocked, so that no bacilli will be found. The guinea-pig test is more delicate, but if negative should be repeated.

A tuberculous kidney is hopeless. Early operation is as necessary as in cancer. Early recognition and nephrectomy are essential for a cure.

The recognition of surgical kidney occurs later than it should. Too many physicians treat bladder symptoms without looking into the cause. The bladder is more frequently an indicator of disease above or below it than a primarily diseased organ. Recognition of this should enable one to diagnose renal tuberculosis, lithiasis, and all degrees of pyelitis and pyonephrosis more frequently and much earlier.

H. G. HAMER.

Johannessen, C.: Surgical Treatment of Wandering Kidney (Vandregrens kirurgiske behandlinger). *Norsk Mag.*, Kristiania, 1917, lxxviii, 1017.

Johannessen operated in 11 cases of wandering kidney, all occurring in women, following Rovsing's technique which, according to its author, gave 85 per cent of recoveries in the last series of 107 cases, and 50 per cent of recoveries in complicated cases. Johannessen compares the results obtained by other operators, which do not show more than 75 per cent of recoveries in uncomplicated cases.

All of the cases operated upon by Johannessen involved the right kidney. Of 7 uncomplicated cases, 6 were cured and one was much improved. Four with gastropoiesis were improved and 2 cured.

He recommends careful examination of the kidney for calculi, etc., before fixing it; also the administration of something to maintain peristalsis after the operation.

W. A. BRENNAN.

McNeill, W. H., Jr.: Two Cases of Inflammatory Stricture of the Right Ureter Due to a Pelvic Abscess Following Ureterotomy of the Left Ureter. *N. Y. M. J.*, 1917, cvi, 786.

The author reports two cases of inflammatory stricture of one ureter due to pelvic abscess following ureterotomy for stone in the opposite one. He regards these cases as surgical failures and emphasizes the hazard in any open operation for the removal of stone in the ureter. Both patients underwent prolonged stay in the hospital, and one required nephrotomy for relief; the other will require nephrectomy before clinical cure is accomplished.

J. S. EISENSTADT.

BLADDER, URETHRA, AND PENIS

Watson, E. M.: Notes on the Recognition of Certain Lesions of the Male Bladder. *Ann. Surg.*, Phila., 1915, lxxvii, 96.

The author takes up briefly the diagnosis and treatment of the commoner lesions of the male bladder. He states that the success in the treatment of these conditions almost invariably depends upon the ability of the observer to interpret correctly the cystoscopic findings.

Prostatic changes are either hypertrophic (benign) or non-hypertrophic. The following hypertrophic conditions of the prostate may be determined: (1) middle and lateral lobe involvement; (2) Albarran lobe involvement; (3) subtrigonal gland involvement. The non-hypertrophic conditions of the prostate which are recognizable are: (1) median bar formation; (2) median bar with circular fibrosis. Cysts of the prostate may also be determined cystoscopically.

True hypertrophy of the trigone is a muscular hypertrophy, and is usually secondary to some type of obstruction situated directly at the vesical orifice.

Bladder changes due to spinal lesions are recognized cystoscopically by the condition of the bladder wall and by the dilated condition of the internal sphincter.

The study of bladder tumors is a most interesting and important one cystoscopically. Clinically and practically the main issue is to determine whether the tumor is benign or malignant.

Vesical calculi are readily and quickly diagnosed cystoscopically by their characteristic brownish or white color, by their mobility in the bladder and by their hard consistency when touched with the end of the cystoscope.

Diverticula are usually noted cystoscopically before they are demonstrated by other means.

Primary tuberculosis of the bladder may be said to be extremely rare.

Accompanying practically all of the lesions mentioned above, particularly if they have existed for any length of time, there is usually a certain amount of cystitis. This may be either a generalized cystitis, causing a hyperæmia of the bladder mucosa, or a localized inflammation occurring most frequently on the posterior wall and vertex of the bladder. This latter form of cystitis exists often as a definite ulcer with an elevated puckered mucous membrane with broken edges.

E. C. ROOS.

Martin, S. P.: Dumb-Bell Stone in the Diverticulum of the Urinary Bladder. *Ann. Surg.*, Phila., 1915, lxxvii, 94.

A review of the literature of the past ten years on diverticula of the bladder discloses only few references to instances in which stones have been found in a diverticulum. Thomas, in a recent complete study of all cases of diverticula examined in the Mayo Clinic during the past eight years, reported 27 cases. In only three were stones found.

Two of these each contained a single stone, while the third contained several small stones, but none were dumb-bell in shape nor of large size.

The author reports an interesting case from the Mayo Clinic of a huge dumb-bell shaped stone found in a diverticulum of the urinary bladder on the right posterior wall, the smaller half of the dumb-bell extending into the bladder itself. The X-ray showed a dumb-bell shaped shadow in the right side of the bladder, but the cystoscopic examination showed a stone, not so large, fixed to the right posterior wall of the bladder and apparently protruding from a diverticulum.

The patient had had acute retention of urine twice in seven years, and practically the only other symptom he had during this time was a sudden shutting off of the stream during urination. His bladder never felt completely empty, and during the last year he used a catheter once a week.

A cystotomy was performed, the stone removed and the diverticulum excised. The patient made a complete and uneventful recovery. E. C. Roos.

The Treatment of Bladder and Urethral Wounds, and of Kidney and Ureter Wounds at the Front and at the Base (*Traitement d'urgence des plaies de la vessie et de l'urètre; traitement des plaies du rein et de l'urètre dans la zone des armées et à l'arrière*). *Presse méd.*, Par., 1917, p. 790.

A meeting of the chiefs of urologic service for the French army was held at Val-de-Grace in May, 1917. Legueu, Cathelin, Jeanbrau and others attended. The following conclusions were adopted:

BLADDER WOUNDS

1. Bladder wounds from gunshot are of considerable immediate gravity due in great part to the peritoneal and intestinal lesions which very frequently accompany them.

2. The ideal treatment of bladder wounds by suture of the orifice can be done only exceptionally; the results are not what might be expected from it.

3. Patients with bladder wounds reaching the base belong essentially to two classes: those who have been cystotomized and those who have undergone no vesical treatment.

4. Immediate cystotomy appears to be the best surgical treatment of bladder wounds.

5. Enterostomy in the case of vesico-intestinal fistula appears useless in the majority of cases; it has only very limited indications.

6. The cystotomized patients should be evacuated very rapidly into urologic centers of the army, whenever it is certain that the bladder wound is not coincident with an intestinal wound which prohibits early evacuation.

7. All patients with bladder wounds evacuated to the interior should be sent to an urologic center.

WOUNDS OF THE URETHRA

1. Patients with urethral injuries should, if possible, be sent at once to urologic centers.

2. Immediate suture of urethral wounds, always a long and delicate operation, should only be attempted when associated with habitual suprapubic urinary deviation.

3. Simple evacuation by suprapubic cystotomy associated with a wide opening up of the traumatized area suffices as an immediate measure in the majority of cases.

4. All patients with urethral injuries sent to the interior should be evacuated to an urologic center.

WOUNDS OF THE KIDNEY AND THE URETER

Treatment at the front is outlined as follows:

1. Immediate intervention in kidney and ureter injuries is only indicated when there is an important hematoma, a profuse or prolonged hæmaturia or the presence of an intrarenal projectile. Flow of urine through the wound does not of itself indicate an immediate nephrectomy.

2. When intervention is decided upon, it ought to be as conservative as possible, and nephrectomy should only be done when absolutely necessary.

3. In cases where there is doubt concerning the existence of an ureterorenal lesion, the hospital records and observation chart should mention all symptoms likely to clear up an ultimate diagnosis.

The principal operations likely to be carried out at the base may be summed up as follows:

1. Extraction of foreign bodies, even small, not removed at the front.

2. Operations for purulent non-urinary fistula.

3. Operations for renal or ureteral fistula, which have resisted expectant treatment either alone or aided by repeated or continued ureteral catheterization.

4. In certain cases of pyuria treated unsuccessfully by ureteral and pelvic lavage a temporary nephrotomy might be tried.

AUTOPLASTIC OPERATIONS IN URETHRAL FISTULA

1. It is necessary to repair every external deformity or mutilation consecutive to war wounds, not only from the moral and æsthetic viewpoint, but also from the social and economic.

2. It is necessary to send these cases to the territorial urologic centers on account of the long pre-operative treatment and the different procedures possible.

3. It is necessary to evacuate such patients from interior general hospitals to centers for urological plastic operations.

4. It cannot be said that there is any one method of treatment for urethral fistula. If the method of inversion gives excellent results, especially in small fistula, the different "décollement" methods, strip autoplastics or mucous transplantations ought not to be forgotten, especially in cases with large destruction of the urethral walls.

5. Experience having established the superiority of urinary deviation or of intermittent catheterization, such methods ought to be preferred to the retention catheter.

GENITAL ORGANS

6. Later, if necessary, patients with wounds of the genito-urinary organs operated upon can be evacuated to the centers where they have been treated in order to unify methods of treatment.

7. In the case of extensive mutilations and in cases of almost complete penile section, the method of conservation should be applied from the beginning; a primary amputation should never be made.

8. In those operated upon immediately at the front, the opening up may be as extensive as is required; but there ought to be no excisions because all particles of adherent skin are of great use in the course of later autoplastics.

9. In the majority of cases, those patients with fistulous wounds of the urethra treated by autoplastics are re-available for military duty. Fistulae of the posterior urethra are excepted.

W. A. BRENNAN.

Mayo, C. H.: *Exstrophy of the Bladder and Its Treatment*. *J. Am. M. Ass.*, 1917, lxxx, 2079.

The author emphasizes the seriousness of this malformation, and describes the associated pathology.

He discusses the various measures employed for improving this condition. Methods of plastic closure are defective because of the necessity of the use of hair-growing skin, adding to the foulness of the uncontrolled bladder. The septic condition of the bladder has resulted from the use of other earlier methods of relief. Use of other closed cavities, as the cæcum, sigmoid or rectosigmoid as a substitute for the bladder, all have resulted in ascending infections.

The author describes the various methods that have been devised to guard against this. These include insertion of the ureters into the sigmoid colon in such a manner that the faecal content does not pass directly over the ureteral ends, and preservation of a portion of the bladder mucosa, including the ureteral orifice, and its transplantation into the rectal wall to preserve the natural safeguard against infection. The latter method fails from the fact that lack of innervation causes a loss of tone in the muscularis which is essential to this mechanism.

A successful method of guarding effectively the ureteral orifice by tubularizing the ureteral entrance through the bowel wall is described in detail.

The lower end of the large bowel should be used for the site of transplantation because of its lower absorptive powers. One ureter should first be transplanted, and one to two weeks be allowed for tolerance to be acquired to the urine in the bowel, before the second one is transplanted.

This operation is most successful in children of three and one-half to five years of age, at which time they can attend to their own needs. Operation has resulted in giving satisfactory function by this method.

V. H. DEEMAN.

Villa, I. de la: *A Tumor in an Ectopic Testicle* (Un caso de tumor en testículo ectópico). *Rev. clin. de los hosp.*, Madrid, 1917, ii, 41.

The case occurred in a man thirty-four years old who had a hernia since infancy. The scrotum contained but one testicle. He was operated upon with the dual object of treating the hernia and of restoring the ectopic testicle to its position. The hernial sac showed two lobules, the lesser in the scrotal base of the cutaneous orifice of the inguinal canal. The larger projected into the cellular tissue of the abdominal wall. The sac contained fluid only, and was removed without difficulty. The orifice of communication with the abdominal cavity was large. In seeking the aberrant testicle a tumor was found which extended into the abdomen, the limits of which could not be fixed by the exploring finger.

The abdominal wall was incised in order to make a better exploration. On palpation it was found that the canal terminated in the tumor, and there was therefore no doubt that the case was one of a tumor of an ectopic testicle. The tumor was traced to the lesser pelvis in the space between the bladder and the rectum. It was easily separated from the posterior wall, but behind and above there were firm adhesions which could not be detached. It was removed entire after section and ligation of the spermatic cord.

Although a detailed microscopic examination was not made, examination of the tumor showed it to be sarcomatous. The tumor gave no symptoms, either subjective or objective, to denote its presence.

W. A. BRENNAN.

Vivian, C. S.: *The Treatment of Gonorrhœal Epididymitis Complicated by Peri-Epididymitis*. *Ann. Surg.*, Phila., 1918, lxxvii, 103.

The author briefly mentions the history of the development of epididymotomy, calling particular attention to the technique described by Hagner. If the temperature falls to normal in forty-eight hours after operation and remains normal, the method is considered adequate, but if temperature persists, more radical measures should be adopted in certain cases. Obstinate cases treated expectantly for several weeks develop inflammatory adhesions between the testicle and epididymis and the tunica. Virulent acute cases if not immediately relieved produce similar pathology. These two classes relapse repeatedly or drag on indefinitely under expectant treatment.

The technique is as follows: Under general anesthesia the scrotum is opened and the reddened, thickened and friable tunica separated from the underlying structures, laying bare both testicle and epididymis. The tunica is sutured behind the testicle as in the bottle operation for hydrocele. The epididymis is punctured with a blunt probe and silkworm suture drain inserted to be removed in

forty-eight hours, and the scrotum closed down to the drain. Immediate relief of pain is the rule and the temperature reaches normal in thirty-six hours. Hydrocele, frequently a bothersome complication, is adequately dealt with.

The author draws the following conclusions: Epididymitis of long standing develops what might be called peri-epididymitis, which is best treated by the radical method described. The epididymis has an opportunity to return to more nearly its normal size. This method has the advantage of the other surgical measures without danger of relapse. It provides the most free drainage possible. Fulminating acute cases and cases which have been unsuccessfully treated in other ways are best suited for the procedure.

H. G. HAMER.

Barragan, M.: Prostatic Infections Exclusive of Gonorrhoea (*Estudio de las infecciones prostáticas con exclusión de las blenorragias*). *Med. Ibera*, Madrid, 1917, 1, 3.

Barragan has met with 44 cases of prostatic infections, exclusive of gonorrhoea and tuberculosis. Thirty-six cases of prostatitis were consecutive to catheter infection or due to the catheter taking a false route; 5 were due to rectal infections, 3 due to foreign bodies in the urethra, and 2 were due to descending renal and bladder infections.

Of these 44 cases, 9 were followed by abscesses, 4 of which were operated upon by the perineal route and 1 by the rectal route. The other four opened spontaneously, 3 into the urethra, 1 into the bladder, and 1 into the rectum. In the 44 cases there were 2 deaths due to septicæmia.

The author treats the symptoms at length. He thinks that the majority of prostatic inflammations are best treated medically, but when operation is indicated, the perineal route is that of choice, as the rectal approach, although easier, is more exposed to the danger of hemorrhage.

In the discussion on this paper, many other cases of non-gonorrhoeal prostatic infections are reported. The paper was read at the Fourth Congress of the Association Española de Urología which met at Madrid last October.

W. A. BRENNAN.

Suter, F.: Results of Suprapubic Prostatectomy (*Die resultate der suprapubischen prostatektomie*). *Cor.-Bl. f. Schweiz. Aerzte*, 1917, xlvii, 1220.

In 75 cases operated upon by Suter by the Freyer method there have been 5 deaths, or a 6.7 per cent mortality. In his first 16 cases there were 3 deaths; then no deaths in a series of 40 cases, and 3 deaths in the last series of cases. One death was due to embolism, 2 to renal insufficiency and 2 to cardiac insufficiency.

The greatest danger in such cases is from cardiovascular affections. Hemorrhage is also a conspicuous factor and none of the various methods in use against it constitute a guarantee.

In the average of Suter's cases a period of four

or more weeks lapsed before cicatrization. A fistula rarely called for a new intervention. No recurrences of the new-growths were observed.

W. A. BRENNAN.

Pauchet, V.: Systematic Closure of the Suprapubic Wound in Prostatectomy (*Prostatectomie: fermeture systématique de la plaie suprapubienne*). *Presse Méd.*, Par., 1917, p. 729.

In Freyer's operation, according to Pauchet, the wound requires from three to eight weeks to close, and even longer when the operation is done in two stages.

By a technique which he describes and illustrates, Pauchet says that complete cicatrization can be obtained in from twenty to twenty-two days by following a systematic closure of the wound.

After the prostatic intervention the bladder wall is closed by two non-perforating U-sutures with No. 0 catgut and these are knotted. The bladder mucous lining is not included in the suture.

Three sutures of silk-worm gut are taken in such a way that each forms a figure eight. These bring the rectus edges together, at the same time approximating the cutaneous edges. They are passed through the rectus muscle and twice through the outer bladder wall. The skin wound is closed by Michel clips. A compress is applied over the clips and the silk-worm gut passed and knotted over the compress.

After operation a Marion drain is fixed and remains for nine days. On the tenth day it is replaced by an urethral sound for three days. The suprapubic wound can then be sutured. After suture a new retention catheter is fixed and remains eight days. On the twenty-first or twenty-second day this sound is withdrawn, as well as the suprapubic sutures. This method has always been successful. It was first used to combat urinary fistula in wounds which showed very retarded cicatrization. The constant success of secondary sutures had encouraged the author to systematically practice it early in all his operations of this kind.

There may be some urinary complications but they usually clear up if the prostatic excision has been correct and complete.

Pauchet calls particular attention to the desirability of not leaving any particle of prostatic debris, and to leave the cavity clear. If not, the recovery may be protracted by complications.

Pauchet has operated in 477 prostate cases. In his last series of 40 there has been no death, though the cases accepted are constantly becoming more of a risk as regards the heart and kidney conditions.

In the two-stage operation, the patient is restricted to a non-nitrogenous diet as far as possible, but otherwise lives his normal life. When the surgeon deems his physical condition in every way satisfactory and his resistance good, the time for the secondary prostatectomy is fixed.

W. A. BRENNAN.

SURGERY OF THE EYE AND EAR

EYE

Allport, F.: The Removal of Steel Particles from the Interior of the Eye by the Magnet. *Illnesses M. J.*, 1917, xxxii, 305.

Unless the foreign body is quite apparent, it is often believed there is nothing in the eye, and X-ray pictures, even though not infallible, should always be taken in view of possible subsequent litigation.

The author deprecates intra-ocular procedures for extraction, though he admits that some eyes have been saved by such methods, since the particle, if not removable by a powerful magnet applied to the lips of the wound, is either behind the eye or stuck fast in its coverings and had best be left alone.

It is unwise to use the magnet for diagnosis as it creates too much intra-ocular disturbance if steel is there, and a diagnosis can be made better by gentler and surer methods.

An eye which shows a wound of cornea, sclera or lens may have nothing in it; a long particle may have produced the wound and then have been removed by winking or otherwise.

Where a large particle has entered the eye enucleation had best be done at once. Haab advocates the anterior portion of eye as the route for removal, but the author disagrees; in his experience scleral incisions are much safer and easier than endeavoring to draw the particle over the ciliary processes, around the lens and through the pupil and corneal incision.

The Victor and Sweet magnets are recommended as an equipment.

Subject to modifications, the author's method of extracting foreign particles is:

1. If the particle is in the lens or anterior to it, extract through the cornea, massaging and washing out the injured lens matter.

2. If the particle is posterior to the lens, make a triangular conjunctival flap with the apex forward and incise the sclera with a Graefe knife between and in the direction of the muscles, placing the magnet in a position judged best after careful study of X-ray plates.

S. S. Howz.

Calderado: Clinical, Anatomic and Bacteriologic Researches on the Lachrymal Glands (Sul estrazione della ghiandola lacrimale). *Ann. di ottol.*, Roma, 1917, xl, 35.

Calderado's results are as follows:

1. The abundant and continuous epiphora persisting after destruction of the lachrymal passages depends in the majority of cases upon abnormal hypersecretions of the lachrymal glands.

2. This disturbance ceases on the removal of the orbital lachrymal gland and more certainly with the removal of its palpebral part.

3. Such intervention is easy and rapid and is always efficacious since at the same time it suppresses the function of the orbital gland by destruction of its secretory canals.

4. The lubricant fluid of the conjunctiva which contains traces of albumin is always kept alkaline by the presence of chlorides after removal of one of the two glands.

5. The removal of the orbital gland reduces the quantity of lachrymal secretion below the physiological limit and explains the function of the gland for the continuous lubrication of the conjunctiva.

6. After removal of the orbital gland or the palpebral gland, the conjunctiva is insufficiently lubricated from 2 to 6 days. This is compensated in time by hypersecretion of the subconjunctival glands. In inveterate trachoma alterations of the subconjunctival glands are never absent; they may atrophy and disappear. Removal of either gland exposes the eye to parenchymatous dryness.

The palpebral gland may safely be removed when the conjunctiva is normal; it is always contraindicated in extensive and deep forms of cicatricial degeneration of the conjunctiva by trachoma, etc., in such cases conservative surgery such as Toti's operation is preferable.

The microbic contents of the conjunctiva in the case of abundant epiphora consecutive to removal of the lachrymal sac are slight and inactive; after the removal of one of the glands there is an increase. When the conjunctiva is affected by chronic trachoma, the microbe content is greater, so that the integrity of the cornea may be menaced.

W. A. BRENNAN.

Carr, A. M.: Tension in Normal Eyes Before and After Tonsillectomy. *Arch. Ophth.*, 1918, xlvii, 46.

Observing that cases of iritis with secondary glaucoma had shown improvement in the iritis and marked lowering of tension within twenty-four hours after the removal of abscessed tonsils, observations were made with the Schiotz tonometer on one hundred cases to determine exactly what effect the operation had on previously normal eyes.

Tension was taken a few hours before and twenty-four hours after removal of the tonsils.

In two cases of secondary hemorrhage there was a considerable degree of exsanguination.

In 95 per cent there was no variation between the reading before and after greater than 2 mm., which is in the range of the normal error of observation.

No case showed a variation of more than 5 mm.,

and the author feels justified in concluding that tonsillectomy, even when accompanied by considerable hemorrhage, does not have any effect on normal intra-ocular tension. S. S. HOWE.

Monson, S. H.: Care of the Eyes of School Children. *Ohio St. M. J.*, 1917, xii, 813.

The author recites the program followed in the Cleveland schools in testing and taking care of the eyes of school children.

In the first place, an eye clinic has been established at one of the schools where the children's eyes are refracted and the usual follow up system by the nurse is detailed.

In the second place, room is made for educating the blind in the public schools.

In the third place, a special center is established for those children whose vision is so defective that they do not see enough to do the work in the regular classes, and yet have enough vision so that they need not be taught to read with their fingers.

These classes are called the conservation of vision classes and include: (1) myopes of eight or more diopters; (2) children having macula or leucoma of the cornea with vision less than 6/15; (3) hyperopes of more than eight diopters of hyperopia and having symptoms of asthenopia; (4) congenital cataract cases which have been operated upon, whose vision is 6/15 or less; (5) children who can not read more than 6/30 at a distance; (6) children with interstitial keratitis, uveal or corneal disease, who are under treatment and have been temporarily withdrawn from the regular classes.

Lately a trachoma school has been organized for children suffering from this disease.

OTTO M. ROTT.

Byers, W. G. M.: Elliot's Operation; Complications and Unfavorable Results. *N. Y. St. J. Med.*, 1917, xiv, 545.

Referring to Elliot's operation as a rational and effective method of combating some, if not all, types of glaucoma, the author discusses the complications, and the methods of meeting them, with observations in regard to their causation.

In expulsive hemorrhage, the author advocates Verboef's procedure of pressure over the trephine hole to arrest the flow of vitreous, with immediate angular scleral punctures combined with the excision of tongues of sclera to insure permanent drainage, and injections of normal salt solution into the vitreous to force the choroid back into place.

In malignant glaucoma, developing during or shortly after operation, Weber's method of making a posterior sclerotomy followed by steady pressure with a curette over the cornea to force the lens backward, re-establish the anterior chamber and re-open the spaces of Fontana, is recommended. If Weber's method fails, extraction of the lens and rupture of the hyaloid membrane, as suggested by Smith, is the only recourse.

Among causes underlying a return of tension,

down growth of surface epithelium into the anterior chamber is mentioned, and to prevent this Elliot insists on a conjunctival flap of such a size that the upper edge is so far removed from the trephine hole that epithelium cannot grow into the opening.

As the endothelial cells lining Descemet's membrane prevent the filtration of aqueous into the tissues of the cornea, it is essential to drainage that the break in them be maintained, and hence a trephine hole of at least 1.5 mm. must be made.

Trephine wounds of the cornea are much like similar openings in the iris, in that there is little disposition to closure, and so the hole must be made in part at least in the cornea, faulty position in this respect being the chief cause of failure.

The author criticises the use of wet instruments, contending that infection is often thereby carried directly into the eye, and he objects to irrigation of the conjunctival sac after operation, for the same reason. S. S. HOWE.

EAR

Abrand, H.: Traumatism of the Auditory Apparatus (Étude sur les traumatismes de l'appareil auditif). *Rev. de laryngol.*, Par., 1917, xxxvii, 433.

Abrand presents a detailed study of the traumatism of the ear in war, especially those due to explosions. He deals particularly with the traumatic pathology of the drum and tympanic cavity, giving the various types of lesion which occur. The methods of examination and tests to be applied are described with typical cases.

Infection occurring in connection with a traumatism may originate in three ways: (a) It may occur as the result of infective agents from the soil, etc., entering the ear; (b) it may be the re-awakening of an old infection; (c) it may be the result of improper lavages.

The author reviews the various prophylactic measures suggested to guard against infection and indicates active treatment to be observed when infection has occurred. W. A. BRENNAN.

Blackwell, H. B.: The Complete Mastoid Operation. *Ann. Surg.*, Phila., 1917, lxi, 640.

The distinctive features in the author's technique are: (1) the curettement of the attic; (2) light packing of the wound; and (3) daily dressings.

The author's purpose in adopting these procedures is:

1. To prevent as much as possible the development of those serious intracranial and other complications which sometimes follow an inflammation of the mastoid or an operation for its relief.

2. To reduce the time required for the healing of the mastoid wound, which varied from three to five weeks.

3. To render the dressing as painless as possible.

4. To improve the appearance of the healed wound. The depression is scarcely noticeable.

OTTO M. ROTT.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Gleason, E. B.: The Treatment of Suppuration of the Accessory Sinuses of the Nose. *Laryngoscope*, 1918, XXVIII, 1.

The author makes a plea for non-operative treatment of suppurative conditions of the accessory sinuses by substituting the suction apparatus for the knife.

He states that he obtains entirely satisfactory results and that he has done no operative work, except on the antrum, since using the suction apparatus.

Case-reports of the following conditions are appended in order to illustrate the results obtained:

1. Severe acute frontal sinusitis.
2. Acute suppuration of the anterior ethmoid cells with an orbital abscess.
3. Acute suppuration of the right frontal sinus.
4. Chronic suppuration of the frontal sinus, anterior ethmoid cells and antrum.
5. Chronic suppuration of the left frontal sinus.
6. Chronic suppuration of the posterior ethmoids and sphenoids.

OTTO M. ROTT.

Stein, O. J.: A Case of Nasal Sarcoma Cured by Radium. *N. Y. M. J.*, 1917, CVI, 1975.

Following the completion of the treatment of this case by radium, there was an opportunity for a postmortem study, the patient having died from an unrecognized suppurative appendicitis.

The case was first seen in July, 1916. At that time, the patient was anemic and poorly nourished. The right eye protruded so that the lids could not cover the ball. The anterior nares were excoriated from nasal discharge, the nasal bridge was widened, and the surrounding tissues thickened. There was occlusion of the nares, the patient being a mouth breather. The right nostril was blocked by a pale-colored hard mass which showed beginning necrosis. There was a large, painful mass of cervical lymph glands on the left side. The patient's age, history, general appearance, local findings and microscopic findings all supported the diagnosis of a sarcoma of the round cell type.

The attempt at surgical removal was a failure, and radium treatment was undertaken. From September 25 to January 27, treatment was given to the primary growth and also to the secondary involvement of the cervical glands, a total of 4,100 milligram hours being given about the nose and 2,125 milligram hours about the large glands.

At the last examination, there was no evidence of a tumor. The general condition was improved and local symptoms were entirely relieved.

At the postmortem a most thorough examination was made of the skull and accessory sinuses, and no evidence whatever could be found of the new-growth. The author's opinion was that there had been an absolute cure of the sarcoma. W. A. EVANS.

THROAT

King, J. J.: Systemic Conditions as the Result of Tonsillar Infections. *Med. Clin. N. Am.*, 1918, I, 799.

The author reports two cases:

The first patient had an acute endocarditis, valvular disease complicated by pericarditis with effusion; the focus of infection was in the tonsils. He was gradually getting worse under ordinary treatment, i.e., digitalis, sodii salicylate, bicarbonate of soda, etc.; but after he received vaccine improvement began. Autogenous vaccines from the staphylococcus albus were given. The patient felt so well that he refused to have the tonsils enucleated.

The second patient had a chronic infectious arthritis, and a gram-negative diplococcus infection of the tonsils. Under autogenous vaccine treatment, 200,000,000 three times a week, great improvement resulted. After the activity of the infection ceases, the tonsils are to be enucleated. OTTO M. ROTT.

Isaacs, H. E.: Stenosis of the Nasopharynx; Operation with Prosthesis. *Laryngoscope*, 1917, XXVII, 885.

The method employed to maintain the opening was by means of an appliance consisting of a pair of wire spring holders, fitted to the molar teeth on each side of the upper jaw, joined by a bar fitting into the arch of the palate. From this bar two wires run back to the nasopharynx and support a vulcanized rubber tube, made into a form conceived to be that which the operative opening would measure.

OTTO M. ROTT.

MOUTH

Toomey, N.: Congenital Paramedian Sinuses of the Lower Lip. *Arch. Pediat.*, 1917, XXXIV, 924.

Toomey reports an interesting case of paramedian sinuses of a female child eight months old, full term and normal delivery, having a complete cleft of the hard and soft palate, a double harelip complicated by a sinus on each side of the median line of the lower lip, which upon squeezing yielded a small amount of clear mucus. Just in front of the sinus openings were hemispherically raised areas about four mm. in diameter. Toomey gives a résumé of the bibliography of this abnormality involving the lower lip. M. N. FIEDERSPIEL.

Trotter, W.: Suggestions Toward a Systematic Operative Treatment of Gunshot Wounds of the Mandible. *Brit. M. J.*, 1915, 1, 49.

The treatment of gunshot fractures of the mandible can not as yet be regarded as wholly satisfactory.

From the number of these cases that reach the London general hospitals, it seems that the difficulties, both as to asepsis and plastic work, met with in these cases are closely similar to the difficulties met with in malignant disease in this region. The infective processes of traumatic cases seem to be almost exclusively of buccal origin.

The surgical problems met with in serious wounds involving the lower jaw may be arranged in three groups:

1. Complications following soon after the wound. Hemorrhage from the soft tissues of the floor of the mouth or tongue may be persistent or recurrent and is difficult to control. Acute sepsis, running an acute course of about a week, with a tendency to produce sloughing and to spread as a deep cellulitis, occurs. Secondary hemorrhage is peculiarly liable to appear from the seventh to the tenth day, due to sloughing.

2. Complications during healing; i.e., chronic suppuration, recurrent abscesses, and necrosis of the jaw. These complications are apt to prolong the convalescence indefinitely.

3. Difficulties of plastic reconstruction of the jaw. Relapses of sepsis after bone grafting may be due to the impossibility of exposing the bone on either side of the gap without opening the buccal cavity, or to implantation of the graft in the septic scar which has resulted from prolonged suppuration.

When there has been a large loss of bone substance, as is very common, no amount of fixation can lead to reconstruction of the bone, and it is toward the latter purpose that all treatment must be directed. II, by fixation, displacement of the fragments can be prevented until reconstruction can be undertaken, so much the better, but the reconstruction must be regarded as the essential purpose.

For considerations of treatment, cases may be divided into three classes:

1. Fractures without considerable loss of substance, actual or probable,

2. Fractures with considerable loss of substance, either actual from immediate destruction or probable from necrosis, but with the superficial soft parts more or less intact.

3. Fractures with considerable destruction of

bone and overlying soft parts, as when the bone and lower part of the face are blown away.

The first class lends itself to treatment by intra-buccal fixation and may be expected to give results almost as good as those of the ordinary fractured jaw of civil practice. The treatment of the third class is not discussed here. The second class is an especially common and troublesome one.

It is in this second class of cases that inaccessibility of the soft parts is extreme, and the ordinary methods of control of hemorrhage here are helpless. Free access to the whole wound by uncompromising division of the overlying soft parts in order to allow of such excision of the wound surfaces as seems necessary and subsequent suture is the first suggestion which a consideration of the general surgical principles provides.

If it had been established by X-ray that considerable destruction of bone had occurred and possibly that further loss by necrosis was probable, it would be clear that no attempt to secure union by ordinary methods was possible, and that everything must be done to favor the success of the necessary plastic operation.

A preliminary puncture laryngotomy should be done and the pharynx plugged, or an intratracheal anæsthetic given. The fracture should be exposed, loose fragments of bone removed, the wound in the soft parts excised, the ends of bone freshened by saw cut, and the alveolar border cut back to an angle. The cheek, floor of the mouth and side of the tongue should then be brought together with mattress sutures to obliterate any cavity between the ends of the bone. A large opening should be left below the jaw for drainage. Intra-buccal fixation should then be used if possible, and the necessary plastic operation should be possible within a few weeks.

Plastic operations on the mandible are especially difficult because of irregular scars in which it is difficult to bury a graft without opening the buccal cavity. It seems a reasonable precaution to make an effort to maintain the vitality of the bone graft implanted in the jaw, this can be done by using pedunculated grafts, i.e., excising a piece of bone to which muscle is attached and using the muscle as a pedicle. The sternomastoid to be attached to the skull, the trapezius and levator anguli to the scapula or clavicle, but especially the sternomastoid to the inner end of the clavicle lend themselves to detachment and displacement into the gap in the jaw, the bone grafts being maintained in position by screws or plate.

V. C. HUNT.

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Mouth

Throat

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INTERNATIONAL ABSTRACT OF SURGERY

JUNE, 1918

ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Marquis and Others: Suture of Wounds During a Period of Attack (*La suture des plaies en période d'attaque*). *Bull. et mém. Soc. de chir. de Par.*, 1917, xlii, 2281.

In one of the recent large battles the surgical provision made in the authors' zone for immediate treatment of the wounded consisted of six large newly constructed operating rooms with accessories. In addition there were 11 surgical and 4 radiologic automobiles. The organization permitted 178 operations to be done in the first twenty-four hours, the majority of the cases arriving from 6 to 12 hours after being wounded.

The authors think that in the actual conditions of warfare the wounded should have their wounds sutured whenever circumstances permit. To accomplish this, all limited soft part wounds after excision were passed on to the rear hospitals for primary suture. All other cases were primarily sutured on the spot, i.e., fractures, articular, cranial and thoracic wounds in which primary suture had a functional and vital importance.

In all 398 patients were treated, representing 550 wounds; 342 were soft part wounds, 132 bone, 34 total, 15 cranial, 11 of them with open meninges, 19 abdominal, and 12 thoracic wounds. Of the total 550 wounds, 109 were primarily and 370 secondarily sutured. Fifty days later, 108 of the 398 patients were convalescent; 122 were progressing rapidly toward cicatrization or had been evacuated for special treatment. There are only 45 patients who have not benefited from suture. The total mortality was 50, or 6.3 per cent. W. A. BUESSON.

Churchman, J. W.: A New Incision for Exposure of the Lower Abdomen and Pelvis. *Ann. Surg.*, Phila., 1918, lxxvii, 180.

The incision here described was devised by the author on account of his dissatisfaction with the

exposure given by other incisions in operating upon the rectum and on the pelvic ureter. Just as in the upper abdomen the hockey-stick incision provides excellent exposure of the common duct, so the author regards his incision as the one of choice when wide exposure of the lower abdomen is necessary. The technique of the incision when used on one side alone is as follows:

1. The skin incision begins at the symphysis pubis, runs in the midline upward for about two inches, then diagonally upward and outward toward the anterior superior spine. The point at which the longitudinal incision becomes oblique may be higher or lower, according as the chief exposure desired is the upper or lower part of the pelvis.

2. Fascial incision repeats the direction of the skin incision, dividing the rectus sheath longitudinally, then crossing obliquely the anterior sheath and dividing the fascia of the obliquus externus muscle in the direction of its fibers and as high toward the anterior superior spine as desired. It is of great importance, in operating upon the bladder, that the anterior sheath of the rectus be divided down to the bone at the symphysis pubis.

3. Muscle incision. The rectus muscle, thus exposed, is freed and divided between clamps. Care is taken to push back the epigastric vessels from the posterior surface of the muscle, to clamp, divide and ligate them separately.

4. The fascia of the transversalis muscle and obliquus internus muscle and the perineum are divided by an incision which repeats the direction of the skin incision.

In closing, the peritoneum, with the transversalis and internal oblique fascia, is sutured by a running stitch.

The divided rectus muscle may be approximated by mattress sutures. No effort at accurate approximation should be made, nor should the stitches

be drawn tightly. A good approximation of the rectus muscle is not necessary; the strength of the abdominal wall depends on the careful closure of the fascia and that is done on the principle which governs the radical cure of hernia.

The anterior sheath of the rectus and fascia of the obliquus externus muscle are closed by the overlapping method used in the radical cure of hernia, a flat overlap being obtained by one layer of mattress sutures, and a second layer which tacks down the free edge. The skin is closed by a running stitch.

The author also describes the bilateral incision. The paper is well illustrated. P. G. SKILLERS, JR.

Dunn, G. R., and Wynne, M. N.: Clinical Observations on the Hæmoglobin After Operation.
Bull. Johns Hopkins Hosp., 1918, XXIX, 17.

The authors draw attention to the fact that there are but few observations in the literature on the hæmoglobin of surgical patients after operation. Grunwald in 1886 published a series of ten cases, from which he concluded that there is little or no oligochromæmia immediately postoperative, even after abundant hæmorrhage. His work, however, does not show when or for how long the hæmoglobin decreased.

The lowest point of the hæmoglobin curve, the authors state, is of interest to surgeons as a clinical estimate of the amount of blood lost at operation. They have been unable to find any data on this point in the literature. According to Laker, quoted by Grunwald, immediately after operation there is no change, or very slight change, in the hæmoglobin, but after several days in cases in which there has been severe hæmorrhage, there is also a great reduction of hæmoglobin. After hæmorrhage the total blood volume is decreased, the quality of the blood being first changed when it becomes thinned, owing to absorption of fluids from the intestinal tract (Hoppe-Seyler and Penzoldt, quoted by Grunwald).

In the series of cases reported by the authors, they have endeavored to show the effect upon the hæmoglobin of operations during which there has been slight, moderate, or severe hæmorrhage.

The Sahli hæmoglobinometer was used for hæmoglobin determinations, as it is an instrument particularly adapted to general clinical use. A uniform technique was observed throughout, and in almost all cases one instrument was used for all the readings on a given case. When two instruments were used on the same case, they were carefully checked against each other and corrections made, when necessary. The series of readings on a given case was made by one observer, or, when two took part in it, their findings were carefully controlled and corrections were made when necessary. In most cases the exact time of an observation was noted so that the number of hours between any two readings could be determined easily from the tables. The blood was

obtained from the finger or ear, the same source being always employed for any given patient. All of the gynecological patients were operated upon under anaesthesia, nitrous oxide and oxygen, followed by ether administered by the open drop method. In tables which accompany the article, the date, time and character of the operation is recorded.

The hæmoglobin readings shortly after operation showed very little change when compared with readings made before operation, even in cases of severe hæmorrhage. The immediate postoperative reading often showed some increase over the pre-operative reading. The lowest point of the hæmoglobin curve was found usually from 30 to 60 hours after operation, a difference of less than 5 per cent was not considered.

The greatest drop in hæmoglobin was usually during the first 24 to 36 hours, and was most rapid when salt solution infusions had been given.

In the series showing only a slight loss of blood at operation, the hæmoglobin readings were usually higher during the first 12 hours than those made before operation, and there was very little post-operative decrease at any time.

GEORGE F. BULLIV.

ASEPTIC AND ANTISEPTIC SURGERY

White, C. S., and Hunter, O.: The McDonald Solution. *Am. J. Obst.*, N. Y., 1917, LXXVI, 986.

The authors have carefully noted results in 150 operative cases of the use of McDonald's pyxol-acetone-alcohol solution as compared with former results from the iodine method of preparation. Four tables explain these findings in detail and demonstrate the care employed in making the tests.

In the opinion of the authors, the McDonald solution gave results inferior to the iodine method; it is not adapted for the routine sterilization of the hands from its irritating qualities; it can be used for mucous membranes; it is slightly cheaper than the iodine solution. Sterilization of the skin is unsatisfactory; it does not destroy spore-bearing organisms.

CAREN CULBERTSON.

McCartney, G. E., and Mewburn, F. H. H.: The Technique of the Carrel-Dakin Treatment.
Brit. M. J., 1918, I, 170.

The solution is prepared daily according to the method of Daufresne, tested for hypochlorite content, and sent to the ward in a carboy of amber glasses, without the addition of potassium permanganate. The solution is tested by one of the surgeons and if found of correct strength the potassium permanganate is added and the bottle stored in a closet until used.

The use of a solution around 0.5 per cent often causes a scalded appearance of the wounds and the best results are obtained when the strength of the solution is limited between 0.460 and 0.485 per cent.

All the Dakin bottles are fitted with a rubber cork, rubber tubing, and pinch cock. A series of tests showed that brown duck covered bottles are the best for protection of the solution; and that properly protected the solution will retain its potency for at least forty-eight hours.

A dressing carriage equipped with a liberal supply of instruments, syringes, etc., is essential. All the instruments are sterilized by ten minutes' boiling. The Carrel tubes are syringed out with warm water, scrubbed with a brush, soaked all night in Dakin's solution, washed off with ether, and then boiled for thirty minutes in a caustic soda solution.

The vaseline pads are made from cheese-cloth, cut in strips six by four inches in sets of twenty, dipped into hot vaseline, the surplus being drained off, and the strips placed in layers in a tin box with a perforated lid, and this sterilized in the operating room.

The medical officer does all the dressings with a nursing sister and two orderlies as assistants, whose duties are limited to the dressings and preparation of the same. One orderly looks after the sterilization of the instruments and their delivery, the other assists with the patients. The sister's attention is restricted to the carriage, handling all instruments and dressings with forceps which a nurse is not allowed to touch those used by the surgeon. The wounds, tubes and dressings are never touched with the hands, but always with clean forceps. No patient receives Dakin's solution less than two hours before dressing, which insures the bacterial count not being diluted.

Wounds are syringed with normal saline or Dakin's solution; the surrounding skin dried, and one ply of vaseline gauze applied to the edges of the wound and smeared to the skin, which allows overflow of the Dakin's solution without a Dakin's dermatitis resulting. The Carrel tubes are applied and the wound covered with a pad of absorbent cotton, or better, so placed as to catch the overflow of Dakin's solution, leaving the wound as little shut off from the air as possible. The results obtained with this technique have been most satisfactory in the majority of cases. V. C. HUNT.

Taylor, H. D., and Austin, J. H.: The Solvent Action of Antiseptics on Necrotic Tissue. *J. Exp. Med.*, 1918, xxvii, 155.

The recent interest in the chemical sterilization of wounds has led to the introduction of numerous new antiseptics, each of which has in turn been advocated because of some advantage, real or apparent. For many of these compounds, claims have been made which have not always been confirmed by carefully controlled experiments. Carrel and Dehelly have emphasized that, for the removal of the necrotic tissue that remains after mechanical cleansing, Dakin's hypochlorite solution was the antiseptic of choice because of its solvent action on devitalized tissue, and Dakin and Dunham have also recognized the value of the hypochlorite solution for this purpose.

Dakin's solution has been shown by Fiessinger and his co-workers to have a disintegrating action on pus cells. Rous and Jones have shown that intact leucocytes protected virulent bacteria which they ingested from the action of antiseptics, and that subsequently these bacteria proliferated under suitable conditions. Dakin's solution, by its solvent action on these leucocytes, minimized the danger of reinfection of the wound from this source. Because of this action on necrotic tissue, pus and serum clot, Carrel and Dehelly recommended Dakin's hypochlorite solution for the sterilization of infected wounds. Bashford demonstrated the ability of Dakin's solution in high dilution to erode the tissues of the tadpole's abdomen. He showed also that this occurred only after the circulation to the part had been interrupted for some time, due to the death of the organism.

The authors, considering this erosive action of Dakin's solution to be an important factor, planned a series of experiments to compare its solvent action with that of certain other chlorinated antiseptics. Fiessinger and his co-workers having concluded that the essential factor in the solvent action of the hypochlorites was their alkalinity, the authors' experiments were designed to determine the importance of three factors: the alkalinity, the nature of the chlorinated antiseptic employed, and the chlorine concentration of the latter.

From their results as recorded in the present paper, it seemed justifiable to Taylor and Austin to lay considerable stress on the relatively great solvent action of Dakin's hypochlorite solution as contrasted with the more recent and more stable chloramines of Dakin. It also seemed probable that to its greater ability to dissolve necrotic tissue, plasma cloth, and leucocytes it owed its chief claim to preference over the chloramines in the treatment of infected wounds. They state that curves shown by Carrel and Dehelly demonstrated the relative ease with which this solution sterilized grossly infected wounds in the initial presence of such necrotic tissue and pus.

The results of the authors' experiments showed that the solvent action of Dakin's hypochlorite solution in the degree of alkalinity used clinically was due primarily to its hypochlorite content. The slight alkalinity of Dakin's solution, while in itself without solvent action, did, however, increase the effectiveness of the hypochlorite. They feel constrained to differ, therefore, from Fiessinger and his co-workers, who attributed this action of the hypochlorite solutions to their alkalinity. In their weakly alkaline solutions, the solvent action of the hypochlorite solution ceased abruptly at about 0.2 per cent sodium hypochlorite concentration. This phenomenon occurred at a lower hypochlorite concentration as the reaction of the solution became more alkaline and vice versa. Even in neutral solutions, marked solvent action occurred as a hypochlorite-hypochlorous acid concentration of 0.5 per cent. A solution the alkalinity

of which was equal to 0.1 per cent sodium hydroxide exerted a solvent action in the absence of any other factor. Such a solution, however, the authors state is not available for clinical use because of its irritating properties.

Chloramine T failed in these experiments to exhibit any solvent action not explicable as an effect of the alkalinity of the solution in which it was dissolved, and dichloramine-T was also wholly without solvent action. The results of their experimental studies did not, therefore, support the clinical observations of Dakin and his associates, who asserted that "the chlorine in dichloramine T, as in the hypochlorites, has the power of dissolving dead tissues," or similar conclusions reached by Sweet, who stated, "The dichloramine-T also possesses to a marked degree the characteristic power of the chlorine solutions in aiding the digestion and removal of necrotic, sloughing tissues. The new solution seems more effective in cleaning up sloughing tissue than the older chlorine compounds." It seemed probable that the greater solvent action of hypochlorite solution, as contrasted with the chloramines, was related to the greater instability of the former. The authors have been unable to demonstrate a solvent action on blood-clot from any of the solutions of a reaction available for clinical use.

The authors found from their experiments that Dakin's hypochlorite solution had the power of dissolving necrotic tissue, pus, and plasma clot in the concentration and reaction used clinically. Chloramine-T and dichloramine-T did not exhibit this action.

The solvent action of Dakin's hypochlorite solution of the degree of alkalinity used clinically was due primarily to its hypochlorite content, but its slight alkalinity, while in itself without solvent action, enhanced the effectiveness of the hypochlorite.

In the degree of alkalinity used clinically, the solvent action of hypochlorite was absent below about 0.3 per cent sodium hypochlorite concentration.

The hypochlorite concentration at which the solvent action ceased was lower the more alkaline the solution, and vice versa.

None of the antiseptics studied by the authors had demonstrable solvent action on blood-clot.

GEORGE E. BELLBY.

Pilcher, E. M., and Hull, A. J.: The Treatment of Wounds by Flavine. *Brit. M. J.*, 1918, 1, 172.

In an article in the *British Medical Journal* of December 30, 1917, a comparison is made between flavine and the Carrel-Dakin treatment in which the former is given second place, and in which it is stated that flavine delays the process of repair, allows organisms to remain on the wound surface, and prevents epithelial ingrowth. As the authors have used flavine largely in military practice and are confirmed in their good opinion of it as time

passes, it seems to them something of an act of ingratitude to allow an excellent wound dressing to fall into discredit for want of support from its friends.

The difficulty of technique and the high ideal of repair are characteristic of the Carrel-Dakin method, and explain why, though it is one of the most brilliantly successful ways of treating infected wounds in war, it is also one of the most difficult to carry out to full success. It is only in certain hands that it is successful, and when it fails, it fails badly.

The authors state that in more than 5,000 cases treated with flavine they have found that for ease of preparation and application, rapidity when dealing with large numbers of cases, early cleaning of the wounds, and abatement of constitutional reaction to absorption, flavine and its congener, brilliant green, is an admirable application under all circumstances, but especially where surgeons are few, time is short, and wounds are many.

In the series of 50 cases reported it was noted that temperature falls early; that more than one third reach the suture ideal, and that, though there is delay in the process of healing, there is some diminution in the local and general reaction to infection.

The Carrel-Dakin method is not of universal application because of its inherent difficulties of technique. Any simpler method which can be used by less skilled workers and which approaches the suture standard of the Carrel-Dakin method is worthy of an extended trial in the army. In the 5,000 or more wounds under observation no skin irritation has been observed, and in few cases was surface destruction of wounds seen treated with flavine. In these few cases a fibrinous pellicle formed which has been attributed to too strong solution and which can be readily removed with saline solution.

From their cases the authors are unable to see that healing is delayed, that organisms linger in the wound, or that epithelial ingrowth is prevented by flavine, but instead they find their patients with normal temperatures, with no signs of constitutional reactions, with healthy granulating wounds over which epithelium is growing naturally.

V. C. HUNT.

Warner, E.: The Infection of Wounds. *Internat. M. J.*, 1918, XXV, 125.

The essential elements in the healing of wounds are fibroblasts, vascular endothelium, and fibrin.

Whether infection of a wound occurs is largely influenced by: (1) the location of the wound; (2) the character of the wound; (3) the cause of the wound. The staphylococcus is the usual pyogenic organism causing infection, the streptococcus less frequently.

There are primarily two types of wounds to be dealt with:

1. Wounds made during an operation. If the wound is clean, it should not be disturbed for the first 2 or 6 days. In bone operations it is more frequently inefficient technique than poorly devised

operation that gives failure. Skin sutures should not be tied too tightly or pressure necrosis will result.

2. Wounds as the result of accidents. All such wounds should be treated as though infective material had been introduced into them. Too much done to try to remove pyogenic organisms from a wound results in more harm than good, as the sealed lymphatics and capillaries may be opened up.

When a septic condition of a wound is once present, it becomes necessary: (1) to immobilize the infected part; (2) to institute very thorough drainage by incisions sufficiently long and deep to accomplish the purpose sought; (3) to use the hypochlorite solution in suitable wounds and situations.

Warner quotes the ideas of a number of authors along with their methods of treatment. He gives the use of iodine, hydrogen peroxide, Wright's solution, Dakin's solution and the Carrel technique and dilute solution of quinine. Freer drainage is advocated both in external wounds and in abdominal infections. One case is given in brief. Vaccines, either autogenous or polyvalent, have not been of much avail against the usual pyogenic organisms.

CARL R. STEINKE.

Morison, R.: The Treatment of Infected Suppurating War Wounds. *Internat. J. Surg.*, 1918, xxxi, 33.

If it is possible to get to the bottom of an infected wound so that it can be thoroughly cleansed mechanically and suitable antiseptics applied, the wound can then be closed with interrupted sutures, always with impunity, and many times with the prospect of seeing it healed when the dressing is removed for the first time at the end of three weeks. This is a new surgical principle which will not alter, though details of the method will.

The technique is summarized as follows:

1. Under an anæsthetic, usually open ether, cover the wound with gauze wrung out of a 1:20 carbolic acid solution, and clean the skin and the surrounding area with the same lotion.

2. Open the wound freely and, if possible, sufficiently to permit inspection of its cavity. A guide (the finger is best if the size of the wound permits it, and if not, a thick probe) should be introduced to the bottom of the wound and held so that it is fully exposed.

3. Mop the surrounding skin and the wound cavity with methylated spirits and dry it.

4. Fill up the whole wound with "bipp," rub it well in with dry gauze, then remove all excess, leaving only a thin covering over the wounded surface. Dress the wound with sterile gauze and cover all with an absorbent pad, which is held in position by sticking plaster and a bandage. This dressing requires no change for days or weeks if the patient is free from pain or constitutional disturbance.

Redressing is very simply done. After removal of the old dressings, the wound is covered with a dossal

of wool soaked in spirit and the sticky discharge is wiped off the surrounding skin until the skin is clean.

Necrosis of the bone is one of the end-results of sepsis. A separated portion of bone will live and take its part in repair if infection of it can be prevented. This can be done by the author's method of treatment and the consequence is that the majority of the recent fractures show no necrosis at all.

EDWARD L. CORNELL.

Magni, E.: Treatment of War Wounds of the Limbs in a Territorial Hospital (*Metodo seguito nella cura dei feriti di guerra agli arti in un ospedale territoriale*), *Chir. d. organ. d. mov.*, Bologna, 1917, i, 325.

In the territorial hospital of Bologna, during 18 months Magni has treated 3,618 war injuries of the limbs. He has followed the methods of the old surgeons of the sixteenth and seventeenth centuries, notably Magati, who advised as little interference as possible with a gunshot wound after its initial treatment, not even to remove the first dressing for a long time unless under special indications. Movement, according to this old authority, is one of the most frequent causes hindering recovery, which is the work of nature and not of the physician. Although the teachings of Magati had a large following, they fell into disrepute. Magni points out that the best results today are being obtained from the application of Magati's principles of immobilization and abstention from meddling interference.

Of the 3,618 limb wounds treated, 2,373 were wounds of the soft parts alone, 820 were fractures, and 425 were articular lesions.

In the treatment of fractures, Magni uses plaster casts. He does not remove bone chips, as he thinks, contrary to other expressed opinions, that a bone fragment provided with marrow is a point of permanent ossification, and even if it should die, it is eliminated or absorbed. He only removes projectiles if they are easily accessible or cause prolonged inflammation.

Articular lesions Magni generally treats by immobilization alone and has met with very satisfactory results. Only in a few cases was he obliged to intervene surgically. He thinks emphatically that immobilization is the best treatment for articular lesions.

Only 3 amputations were necessary, and among the total 3,618 cases there were only 8 deaths.

In summing up his observations, Magni thinks that none of the more recent methods of treatment are so satisfactory as that instituted by the early surgeons, i.e., reduction, retention, and immobilization of the limb in a good position by a plaster apparatus. These methods not alone help to prevent the spread of inflammatory processes which are generally located in the traumatized points, but they overcome them either directly or indirectly by favoring the formation of a circumscribed purulent collection which tends toward recovery after incision and drainage.

Ligation of the large vessels can be done at any point in their course provided no inflammatory processes exist, these, whether acute or chronic, hinder the establishment of venous collateral circulation, and gangrene of the tissues always follows in the vascular region of the ligatured vessel. The ligation of a large vessel in a limb has not such immediate disastrous consequences on the circulation as in the case of a vessel supplying the region of the brain.

The article is followed by a very extensive bibliography of several hundred war articles on wounds of the limbs and blood vessels.

W. A. BRENNAN.

SURGICAL INSTRUMENTS AND APPARATUS

Fisher, W. E.: Thigh Stump Extension Splint. *Arch. M. J.*, 1918, 1, 229.

The stumps following flapless amputations of the thigh that have come under the author's notice suffered from having been unprovided with some continuous extending force to counteract the natural tendency toward retraction of the soft parts that in these cases leads to conical stump formation.

If the retraction of the soft tissues is permitted to proceed unrestrained until such time as secondary amputation is performed, it will be the general

experience that an undue length of the femur will require removal before the soft parts are capable of apposition, and the ultimate shortening of the stump may prove very disappointing.

The author's splint achieves the requirements in maintaining the necessary continuous uniform traction during all movements of the stump and positions of the patient in bed and during transport. The splint is improvised after the Thomas splint as modified by Jones for the arm. It is bent at the bars until the end meets the leather covered ring to which it is secured with tape. A length of about 20 inches of aluminium splinting is then bent in the form of a circle, loops within, and this hoop inserted and secured by tape or strapping between the ends of the bent bars of the Thomas splint.

Extension strapping is applied to the stump with tape attached to the ends of the straps to be attached to the splint for extension. The splint is put on with the ring fitting well up against the tuberosity of the ischium and extension is made by drawing on the tapes and tying them to the aluminium loop.

The splint is light and moves with all the movement of the stump, the flaps of which are held in extension and the splint itself secured by its extension bands. The open aluminium ring allows for dressings and there is free access to the wound.

V. C. HUNT.

SURGERY OF THE HEAD AND NECK

HEAD

Gamlen, H. E., and Smith, S.: A Study of the Inter-Relation Between the Radiography and Surgery of Gunshot Wounds of the Head. *Arch. Radiol. & Electroradiol.*, 1918, XXII, 240, 270.

In this very useful and interesting article the authors give their experience of the last eighteen months in which they have examined 1,500 cases of gunshot wounds of the head. They give a number of practical conclusions.

1. Method of taking radiographs. Stereoscopic views are essential. A compression cylinder with a paper air cushion is wedged between the head and compressor. A preliminary fluoroscopic screen examination is helpful to locate the missile and in addition a clean new lead wire ring is placed over the wound surface. The area of the wound should be nearest the plate and as near the central rays as possible, for by this means the maximum detail of the injured area is obtained. Seven positions are utilized as standards which bring out the variously located lesions to the best advantage.

2. Interpretation of radiographs. This is carefully considered and the distinguishing characteristics of bone fragments and various kinds of metal particles are explained. The pineal body, the salient points in the diagnosis of fractures, and the con-

fusing elements of vessels, blood-channels, and sutures are described. A method of localization from the stereoscopic plates is illustrated.

3. Classification of the types of injuries with reference to need for surgical interference. No fracture seen in the X-ray examination may, since the introduction of the steel helmet, be a contraindication against operative interference. Several patients who had worn the helmets showed injuries in the region of the apex of the temporal crest. They remained well for two or three days, then increasing optic neuritis, fits, and severe headache developed. Operation disclosed a practically normal bone, but beneath was considerable pulped brain and blood clot.

Small bone cracks were usually left alone. Extensive fissured fractures without depression even running down to and involving the base were usually left alone unless urgent symptoms manifested themselves.

Gutter fractures with only a limited depression of the inner table were usually operated upon to remove the depressed fragments except over the longitudinal sinus. Gutter fractures with considerable in-driving of the inner table were operated upon in each case and penetrating fragments removed.

Penetrating wounds with no missile in the brain invariably require operative interference as the track is septic and has bone fragments in its course.

Wounds with one or more missiles retained in the skull bones were operated upon generally. When the missile lay just beneath, it was invariably removed. When the missile lies in the brain there is found a track of septic brain material with fragments in its course. In the beginning, there was a tendency to remove all missiles unless hopelessly inaccessible, but latterly more expectant treatment has been followed.

Perforating wounds with entry and exit wounds present in the skull are comparatively rare since the use of the steel helmet. C. B. HOLLINGS.

Japiot, P.: Radiography of the Lower Jaw and the Involvement of the Teeth in Fracture Cases (*Radiographie du maxillaire inférieur; rapports des dents avec le foyer de fracture*). *Lyon chirurg.*, 1917, xiv, 823.

Japiot calls attention to the growing importance of radiography of the maxillary region in war surgery and describes the technique.

About one thousand cases have been examined. The author gives the details of several cases with characteristic roentgenograms.

By inspection of the mouth alone it is impossible to detect the real lesions of the teeth; and only minute roentgenograms will give the following information:

1. Any dental fragments between the fractured bones will be shown, and also their differentiation from metallic fragments.

2. The fracture may involve the socket without injuring the corresponding tooth; or it may involve a wisdom tooth still in process of evolution. Radiography will show the condition and in some cases of necrosis, the roentgenograms show this to be the cause.

3. Teeth may sometimes act as projectiles and be driven into the neighboring soft parts, such as the tongue or even into the mandible.

An immediate X-ray enables the surgeon to know exactly the extent of the damage and to prevent infection by proper removal of the organic and inorganic foreign bodies. In old cases a roentgenogram may disclose the reason of persisting infection and fistula or of malunion or non-union. It will also be of service in the application of definite prosthesis by following the formation of sound callus.

W. A. BRENNAN

Lewis, D.: Electric Burn Causing Necrosis of the Skull. *Ann. Surg.*, Phila., 1918, lxxv, 149.

The patient, aged 27, while working on a corrugated tin roof accidentally brought his head in contact with a live wire carrying an alternating current of 11,200 volts. He was immediately rendered unconscious. On regaining consciousness the patient was irrational and violent so that it required three men to restrain him. Six hours after the accident he became rational.

The physician who examined him shortly after the shock stated that the scalp over the junction of

the sagittal and coronal suture had been burned away, leaving exposed a part of the parietal and frontal bones measuring 4 inches in diameter. A burn of the forehead on the right side and another over the right parotid gland were noted. This latter burn had extended deep enough to destroy the fibers of the facial nerve passing through the gland. The gland substance was also partially destroyed, as the patient had a salivary fistula. The feet were severely damaged by the electric shock. Above the right ankle anteriorly the skin was badly charred. All the toes with the exception of the little one were so badly torn and burned that they either dropped off or were removed.

Sloughing of the charred skin occurred much more quickly in this case than in similar cases which have been reported. Separation of the skin was completed in three weeks. Granulation tissue then developed rapidly and normally.

Almost eight weeks after the accident slight blurring of the vision of the left eye was noticed. Shortly afterward cataracts developed in both eyes.

The sequestrum finally became so loose that it could be easily removed with tissue forceps. The sequestrum contained a part of the sagittal and coronal sutures at the point of meeting and the parts of the parietal and frontal bone adjoining them. It included both plates. The dura which was exposed when the sequestrum was removed was covered with healthy granulation tissue. This granulating surface was grafted on the day following removal of the sequestrum with Thiersch grafts.

There were no changes in the respiratory, digestive, vascular or genito-urinary system. Muscular movements were made normally without any inco-ordination. The patient complained of some numbness of the fingers, and also of some pain in the back, but there were no areas of anesthesia.

EDWARD L. CORNELL.

Dretzka, L. J.: Fractures of the Skull. *J. Mich. St. M. Soc.*, 1918, xvii, 47.

The location of the lesion and determination of the extent of the intracranial damage are of first importance in fracture of the skull. Operative interference is imperative in all cases of depressed fractures, compound fractures, simple fractures with evident symptoms of hemorrhage or intracranial pressure, and basal fractures with symptoms of increasing pressure.

If depression is definitely localized and not extensive, linear incision will suffice; if not localized, the "U" horseshoe incision is employed. When it is impossible to localize bleeding which wells up into the field of operation, the area can be packed with gauze to arrest bleeding. The packing is removed in twenty-four hours.

If the dura is extensively lacerated and its edges cannot be approximated, a fat or muscle implant may be resorted to, to cover the defect. In all basal fractures giving symptoms of increasing pressure it is advisable to resort to decompression.

The author presented in outline form the symptoms and differential diagnosis of fractures involving the vault and base of the skull. He also recorded a number of interesting illustrative cases.

In conclusion the following statistics may be of interest:

During the period between October 15, 1915, and December 1, 1917, 396 patients with fractures of the skull were admitted into the receiving hospital. Of this number, 186 were transferred to other institutions within twelve hours after admittance. The mortality rate of the remaining 210 cases was thirty per cent. One hundred and thirty-two cases out of the 210 required operative interference. From seventy to eighty per cent of the fractures of the vault involved the base as well. Thirty-five per cent of the 396 cases showed symptoms of alcoholic intoxication.

M. A. BERNSTEIN.

Cushing, H.: Notes on Penetrating Wounds of the Brain. *Brit. M. J.*, 1918, 1, 221.

The author in taking up his duties in a hospital to which he was attached endeavored to make an estimate of:

1. The operation mortality.
2. The proportion to one another of simple scalp wounds, cranial injuries without dural penetrations, and craniocerebral wounds respectively among all the cases forwarded from the field ambulances on the front concerned, with an initial diagnosis of "head or scalp wound."

During the first two weeks of the three months' period 49.3 per cent of the scalp wounds had dural penetration, of which one-third died without operation, the remaining two thirds all being submitted to operation, and exactly half of the patients dying, giving a 50 per cent operation mortality for wounds of this type.

During the whole three months' period there came under the supervision of the author's team a series, 10.9 per cent of which proved to have merely scalp wounds, 23.7 per cent cranial wounds with intact dura, 60.7 per cent cranial wounds with dural penetration, and 4.5 per cent bursting fractures but with the dura and scalp both intact.

It was the penetrating wounds with which the author was chiefly concerned and a serious effort was made to see whether the accepted mortality of 50 per cent could not be lowered by improvement in technique and more intimate supervision of the individual case. Careful records have been kept of 225 cases, of which 6 died without operation; of the remaining 219, 133 proved to have dural penetration. These are divided into thirds corresponding to the consecutive months of the service: first 44 cases with 24 deaths, 54.5 per cent; second 44 cases with 18 deaths, 40.9 per cent; third 45 cases with 13 deaths, 28.8 per cent.

These percentages are practically end-results and seem to justify expecting 75 per cent of recoveries in an advanced hospital. During the three months' period an operation with certain technical

devices applicable to the average penetrating wound was gradually evolved, to which the lowered mortality percentage in the series can be ascribed. Aside from the principle of track suction, there is nothing new about the procedure.

The main features of the operation lie in:

1. The removal *en bloc* rather than piecemeal of the area of cranial penetration.
2. The detection of the indriven bony fragments by catheter palpation of the track rather than by the exploring finger.
3. The suction method of removal of the disorganized brain.
4. The use of dichloramine-T in oils as an antiseptic.

The routine pre-operative neurological study of the case, stereoscopic X-ray negatives, the shaving of the entire scalp, the invariable use of a local anæsthetic, preferential radial (tripod) rather than flap incision, foreign body extraction with the magnet, closure of the wounds with buried sutures in the galea, the dressing of all serious cases in the operating room, all these steps were contributory to the successful outcome of the more severe cases.

At the casualty clearing station team work is of prime consideration to eliminate all delay. Each team should have an extra table to support the stretchers and cases can be constantly fed in and the various examinations and pre-operative preparations carried on under the surgeon's eye with little loss of time between operations.

Serious cranial operations should not be undertaken without a preliminary neurological study. Without such an examination, an operator cannot be sure whether the paralyses which are subsequently observed were pre-existent or due to the surgical manipulations. The question of justifiable opening of an intact dura or the need of secondary operation for symptoms of presumptive abscess may depend entirely upon the original neurological symptoms. Stereoscopic radiograms are invaluable.

The entire scalp should be shaved and sponged with alcohol and a bichloride of mercury solution instead of iodine or other staining solutions.

About an hour before operation a sedative is given, usually one-third of a grain of omnopon. Fifteen to twenty minutes before operation the lines of the proposed incisions are infiltrated with 1 per cent novocaine and adrenalin, 15 drops to 30 ccm. General narcosis increases intracranial tension, increases bleeding from the scalp and encourages rougher methods of operating, and it leaves many patients in a condition in which inhalation troubles are prone to occur.

For ragged or gutter defects over the vault the author prefers the three-legged or tripod incision. When the three flaps are reflected, ample exposure for trepanation is afforded, and if the flaps are sufficiently undermined, come together without undue tension.

The trepanation *en bloc* is done by trephining an opening to one side of the depressed area and with

rongeurs nibbling away bone until an opening of sufficient size has been secured. A more simple and satisfactory procedure is to encircle the area of depressed bone with a number of small punctures made with a perforator and burr and then to connect these with a linear cut.

In penetrating cases the proper and thorough cleansing of the track is the most important step in the operation.

The author has abandoned cutting away the torn, ragged margins of the dural opening, for it does not seem to be the source of infection. Retention of disorganized cerebral tissue which lines the track and in which indriven bone fragments are embedded is more serious.

A flexible, soft rubber catheter has proven satisfactory in determining the direction taken by the missiles and with it the narrowest track can be investigated with almost as great delicacy as by direct palpation. By attaching to the catheter a Carrel-Gentile glass syringe the softened brain may be sucked out, which should be repeated until the cavity is gotten as free as possible of disorganized cerebral tissue. At times pieces of bone come away in the eye of the catheter.

The purposeful incision of the dura in the area of a dirty wound must be done only in those cases in which the neurological symptoms indicate a serious local loss of function or in which the undamaged dura is tense and evidently overlies a clot or contused area. If under these conditions the disorganized matter is washed away until normal tension is restored and the membrane accurately closed, there is practically no risk of infection.

Regarding the removal of retained missiles, the author considers the middle ground position safest, namely, always to extract a foreign body if it can be accomplished without increasing the damage already done when the missile is deep, and always removing superficial ones. Extraction with a magnet is the only justifiable method. After the track has been cleansed, a wire nail is introduced down to the foreign body and the magnet connected to the nail for withdrawal of the foreign body if it is magnetizable.

The use of watery solutions of antiseptics in the brain is disappointing; however, the use of dichloramine-T produced a notable diminution in the number of infections.

V. C. HUNT.

Foerster, O.: An Intramedullary Tumor Successfully Removed. *Berl. klin. Wchnschr.*, 1917, No. 14.

Foerster successfully removed an intramedullary tumor from a man of forty years. The disease began with urinary disturbances. Six months later there was complete spastic paralysis of both lower limbs with exaggerated reflexes and clonus; abdominal and cremasteric reflexes were lacking; there was complete retention of urine, and flaccid paralysis of the upper limbs. All the muscles innervated from the first dorsal segment and from the seventh and eighth cervical segments were

completely paralyzed, while the muscles innervated from the sixth cervical and above were completely intact. The Wassermann reaction of the blood and cerebrospinal fluid was negative; the latter was strongly increased in albumin and xanthochromia.

Laminectomy of the third to the seventh cervical vertebrae and of the first and second dorsal was done. The dura was tense and on incision much fluid issued. The tumor was not found to be extramedullary, the medulla being normal on the exterior. On incision of the posterior cords longitudinally on the right side, an intramedullary tumor was found, its greatest width corresponding to the eighth cervical segment. It extended upward to the fifth and sixth, and below to the second dorsal. The tumor was removed easily and the dura, muscles, etc., sutured. Recovery followed. Microscopically the tumor was a glioma.

By degrees mobility of the limbs returned, but there is some ataxia. In the left arm all paralyzed muscles have recovered their function. In the right arm the greater part of the muscles have their functional capacity restored; there is still some paralysis of the thumb and of the fourth and fifth fingers. Bladder troubles have ceased. It is now one and one-half years since the patient was operated upon; improvement continues and there is no sign of recurrence.

W. A. BRENNAN.

Conkey, C. D.: Ocular Symptoms of Brain Tumor. *J.-Lancet*, 1918, xxxviii, 70.

Conkey discusses the symptomatology of brain tumor from the standpoint of the ophthalmologist and aurist. He says that there are some classical symptoms that are common to all brain tumors and there are others that are dependent upon the region in which they are located. To the first group belongs that group of symptoms which, when existing together, are strongly indicative of a brain lesion causing pressure. This group consists of nausea and vomiting, headache, slow pulse, general convulsions, and choked discs. In the great majority of cases such a train of symptoms indicates the presence of a new-growth, though they may be present in brain abscess, meningitis, or tubercular deposits. Choked disc is the most valuable symptom, existing in 90 per cent of all cases of brain tumor in some period of its history. It frequently exists when no other symptoms are present. Its presence should arouse suspicion of the presence of a growth of some kind in the cranial cavity, but it is not always pathognomonic because a few spinal cord lesions may produce it, such as disseminated sclerosis, acute myelitis, tetany, and multiple neuritis.

He reports a case of an infant of six months with a complete paralysis of both arms and legs. The diagnosis of the attending physicians was poliomyelitis located high up in the cord. Examination of the eye-grounds showed a marked choked disc in each eye. He fails to state the outcome of the case or

whether the diagnosis of the attending physicians proved correct.

Choked disc has also been reported as occurring in some of the exanthemata, and also in typhus fever, diphtheria, influenza and whooping cough, albuminuria, diabetes, scrofula, and anemia. He says the location of the brain tumor seems to greatly influence the choking. Tumors of the frontal lobe rarely produce choked disc, and tumors of the cerebellum nearly always do. As a general rule, tumors of the brain are known to produce choked disc in increasing proportion the farther they are located from the frontal region, and in decreasing proportion the farther they are located from the cortical region.

He states that nystagmus is another valuable symptom of cerebellar tumor. It is usually of the vestibular type where the eye moves from side to side with a slow movement in one direction, followed by a quick movement in the opposite direction.

Vertigo, inco-ordination, ataxia on the side of the lesion, diadokokinesis, loss or impairment of the arthrochal sense, and disturbance of equilibrium are also found in cerebellar tumors. Hemianopsia is one of the most valuable signs pointing to brain lesion. It may be produced at any point from the optic chiasm to the occipital lobes.

When paralysis of the cranial nerves occurs in association with homonymous hemianopsia, it is in favor of a growth below the occipital lobes. Tumors of the pituitary body are easily confounded with those of the occipital lobes. They can be differentiated by reason of the fact that the hemianopsia of the occipital lobes is homonymous and that of pituitary tumors is usually bitemporal.

Tumors of the pons produce numerous and diversified symptoms, owing to the numerous important structures crowded together in this vital region. When the tumor is confined to one side of the pons it may cause a paralysis of the sixth nerve, the trigeminus, and the facial on the same side, causing loss of power of the external rectus muscle and a part or an entire side of the face. When the tumor lies low in the pons, branches of the acoustic nerve may become involved, producing deafness on the same side.

In those cases where several of the ocular nerves are involved, causing multiple paralysis, the lesion must be in the base of the brain in the middle cerebral fossa, for it is only in this region that all the ocular nerves could be encroached upon by a new growth.

He reports several cases illustrating the different varieties of brain tumors.

G. W. HERRICK.

Hassin, G. B.: *Histopathological Studies on Brain Abscesses*. *Med. Rev.*, 1913, xiii, 91.

The author describes two kinds of brain abscess: one a diffuse infiltration of the brain tissues with pus, the other an encapsulated abscess. He reports and describes the histological elements found in each.

In the first variety he found: (a) polymorphonuclear leucocytes, (b) Mechnikoff's macrophages, (c) polyblasts, (d) plasma cells.

Ordinary brain tissue cells were either absent or greatly changed. Nerve fibers were much less changed.

In the encapsulated case the pus consisted of granular bodies and a few polymorphonuclears. The abscess wall consisted of three layers. The inner layer consisted of collagenous fibers without interspaces and very few vessels; the middle zone was thicker, rich in capillaries, plasma cells, polyblasts, fibroblasts, and clasmatocytes; the third layer showed many clasmatocytes, old connective tissue, large fibroblasts about the vessels, plasma cells, and polyblasts.

The author believes that these various pathologic cells are all derived from the blood-cells and he claims that the transitions have been seen in various instances.

H. J. VAN DEN BERG.

Long, J. W.: *Traumatic Brain Surgery*. *South M. J.*, 1913, xi, 31.

Long classifies brain injuries as: (1) brain traumas without visible wounds; (2) scalp wounds with no apparent fracture; (3) tangential, or gutter, fractures of the skull; (4) depressed fractures of the skull from direct blows; (5) penetrating wounds of the brain classified as: (a) puncture wounds, as from a bayonet, (b) wounds from a missile, as a bullet, lodged in the brain, (c) through-and-through wounds.

The results of brain trauma are: (1) death, immediate or within a few hours; (2) shock, concussion and compression; (3) increased intracranial pressure due to (a) shock, (b) hemorrhage, (c) edema, (d) infection; (3) infection due to (a) meningitis, (b) ependymitis, (c) cerebritis; (4) cerebral hernia, or fungus.

The treatment of brain traumas consists of primary cleansing of the wound; removal to a hospital for operation; taking of X-ray pictures; excision of the scalp and bone wounds; discriminating removal of foreign bodies; covering of the exposed brain; complete or partial closure of the wound; only superficial drains, except in the case of abscess, lumbar puncture, repeated as indicated; prolonged rest in bed.

This rapid survey of conditions found in brain trauma leads irresistibly to the conviction that the three great things with which the brain surgeon has to contend are: first, increased intracranial pressure; second, infection; and third, cerebral hernia.

P. G. SKILLERS, JR.

Morpurgo, B., and Ferrio, L.: *Meningococcic Septicæmia Without Meningitis* (*Setticemia meningococcica senza fenomeno di meningite*). *Gior. d. Acad. di med. di Torino*, 1917, lxxx, 388.

Cases of true so-called meningococcic septicæmia are very rare. The author refers to a few cases

reported in literature of a low remittent fever, unaccompanied by meningitic phenomena in which the presence of meningococci in the blood was shown.

The author reports such a case of remittent fever with a species of purpura somewhat like that which is termed "spotted fever." There were no meningitic phenomena. Repeated blood cultures showed the presence of organisms with all the characteristics of meningococci.

W. A. BRENNAN.

Segura, E. V.: The Treatment of Hypophyseal Tumors (Tratamiento de los tumores de la hipófisis). *Rev. Arg. med. argent.*, Buenos Aires, 1917, XXV, 984.

Segura reviews the various operative methods of approaching and removing tumors of the pituitary body. In his own practice he adopts Hirsch's method with a slight modification, which consists in detaching one of the mucous membranes in order to render the sphenohypophyseal cavity accessible by a nasal fossa. This modification he thinks very important when treating neoplasms originating from the sella turcica which become extrasellar, penetrating into the cerebral cavity and consequently incapable of total extirpation. The modification is also applicable to those cases in which, although the tumor is intrasellar, it has a tendency to recur. By preserving an easy open route of access to the sphenoid cavities and keeping in contact with the sella turcica the operation provides the best means for later application of radiotherapy when this is indicated.

In his last seven operated cases by this technique Segura obtained excellent operative results; all healed by first intention and in a very short time.

W. A. BRENNAN.

NECK

Patel, M., and Arcelin, M.: Extraction of Foreign Bodies from the Upper Part of the Prevertebral Region (Extraction des corps étrangers de la partie haute de la région prévertébrale). *Rev. de chir. Par.*, 1917, liii, 640.

The authors point out the difficulty of extracting projectiles from the upper part of the prevertebral region, in the neighborhood of the base of the cranium. They have had to operate in six such cases, details of which they give. The diagnosis is made clinically and the localization is confirmed by a series of radiologic examinations.

The prevertebral region may be approached by these routes:

1. Pharyngeal route: The incision is made in the posterior wall of the pharynx. This route, although apparently easy, is not so. The depth of the region, hemostatic difficulties, and the difficulty of keeping the head in good position are opposing factors.

2. Cervical route: The incision is cervical on the anterior edge of the sternomastoid, similar to

that for ligature of the external carotid. The prevertebral region can be reached by passing inside the vessels and stripping the posterior pharyngeal wall. But the route is difficult and very dangerous owing to tearing of the peripharyngeal plexus. The authors think this route should be avoided.

3. Cervical route. This is especially the route of choice, and it permits direct access to the prevertebral region by drawing the vessels and nerves forward. The incision starts from the posterior edge of the mastoid, follows the border of the sternomastoid until this muscle is crossed by the external jugular vein. It then ascends as far as the occipitalis and sufficiently deep to allow section of the splenius. The splenius is sectioned at its insertion in the mastoid. This is important, as the splenius is the key to the prevertebral region, and if it is intact, exploration is extremely difficult. The vessels and nerves with the internal jugular as adjacent nuclei are gently liberated and together with the sternomastoid are strongly retracted vertically by an assistant. When these preliminaries have been executed, the surgeon can easily explore the prevertebral region with the right index finger. Adhesions can be separated with a sound. When the projectile is discovered, it is extracted by forceps.

In their six cases the authors had only one operative accident, namely, an injury to the internal jugular. Radiograms showing the position of the projectile are given for each case.

W. A. BRENNAN.

Terry, W. I.: Operative Treatment of Goiter. *Northwest Med.*, 1918, xvii, 20.

It should be remembered that iodine should be cautiously used in the treatment of any goiter. Adenomata are not curable by medicine or by X-ray.

The treatment of exophthalmic goiter should be carried out by the physician and surgeon co-operating for the good of the patient. Medical treatment is seldom permanent and surgery is necessary to effect a cure. Each case should be studied individually and an operative time selected during a stage of comparative quiescence. The psychology of the patient should be analyzed and every effort made to eliminate fear. Ligation of one or more thyroid arteries is often advisable preceding resection.

The Kocher collar incision is used. The sternohyoid and sternothyroid muscles are separated longitudinally in small goiters and divided transversely high up in the large types. It is well to leave portions of both the inferior and superior poles so that the parathyroids will not be imperiled. The recurrent laryngeal nerve should be avoided by leaving the posterior sheath of the thyroid. Adenomata may be shelled out, and all such tumors should be removed; otherwise a recurrence is likely.

The divided ribbon muscles must be sutured and

the platysma carefully approximated. Drainage is not necessary if haemostasis has been good, but where a large raw surface of the gland is left, a small folded rubber dam drain is best. As to the secretion of the thyroid causing toxic symptoms by absorption from the wound, the author thinks the idea a myth.

Terry reports 445 operations on 425 patients, with 16 deaths. There are 161 simple and 264 hyperthyroidism cases. The mortality occurs entirely in the hyperthyroid cases. Among the patients, 12 per cent are males and 88 per cent females.

CARL R. STENKE

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Lockwood, A. L., and Nixon, J. A.: War Surgery of the Chest. *Brit. M. J.*, 1918, 1, 105, 145.

This article is another evidence of the general trend in the direction of more active surgical measures, and the authors emphasize the fact that any discussion upon war surgery of the chest must now include abdominothoracic as well as thoracic wounds. There is some danger at present of radical operation being performed in some cases in which it is neither necessary nor indicated, and this is especially true of pure haemothorax. Unless surgeons are able to keep their cases under observation until convalescence is complete, it is impossible for them to form correct conclusions as to the value and ultimate results of their treatment.

The authors were able to do this during the entire Somme offensive from July, 1916, and the same has been the case since August, 1917. Such opportunities have not existed in any other British front unit.

Up to the middle of 1916, wounds of the chest were for the most part treated expectantly, later operations being dependent upon whether or not infection supervened.

At the advanced dressing stations cases of open pneumothorax are greatly improved within an hour or two if the wound is carefully cleaned without an anæsthetic and the skin sutured with silkworm-gut through a plug of gauze so that there is no leakage of air. After such temporary treatment patients must be sent to the casualty clearing station. At the latter they are placed between warmed blankets and are given hot drinks but no stimulants. Continuous proctoclysis of sodium bicarbonate and glucose, 5 per cent of each in water, is started and intravenous sodium bicarbonate, 2 per cent, is given if required. In severe cases blood transfusion is performed. Urgent dyspnoea from hæmothorax or pneumothorax must be relieved before operation by aspirating. If fresh hæmorrhage is suspected, the aspiration should be partial and combined with oxygen replacement.

If the active resuscitation just outlined can be carried out and the services of an expert radiographer are available, then surgical measures which these cases require should be attempted, provided also that the physical signs can be carefully studied, and finally that most perfect asepsis can be secured.

Operation is especially indicated where: (a)

early evacuation will not be necessary; (b) injury of the diaphragm is suspected; (c) open pneumothorax exists; (d) a badly crushed chest is found even though there is no external wound; (e) a large missile has transversed the pleural cavity, whether lodged in the chest wall, pleural cavity, lung, mediastinum or pericardium; and finally (f) on all very acutely infected cases although the missile is not retained.

Repeated X-ray examination is essential during the progress of the case. An aluminum-topped combined operating and X-ray table of the Bonnette Eclipse du Dessane is of the greatest service. The physical examination should at first be limited to ascertaining whether an immediate operation is advisable or possible. If the missile has traversed the mediastinum and traversed both sides of the chest, early operative treatment should never be undertaken. The presence of considerable surgical emphysema obliterates or distorts every other physical sign except the position of the heart. The authors have only observed the condition of massive collapse of the lung upon the non-injured side in very few cases. Only local anæsthesia must be used in cases with bronchopneumonia on the uninjured side.

Signs of involvement of the heart or pericardium do not constitute a contra-indication to operation. The level of dullness does not indicate the size of a hæmothorax and bronchial breathing is not uncommon over a hæmothorax. The latter may occur although the pleura has not been penetrated. Signs of increasing effusion after twenty-four or forty-eight hours are scarcely ever due to active hæmorrhage and the authors have only seen recurrent hæmorrhage in five cases.

The patient is given omno-scopolamine, one ampule, an hour before operation, and if not sleeping, is given one-half an ampule half an hour before being taken to the operating room. A half sitting posture with the injured side dependent is the most comfortable. If he cannot be so placed, the lung should be grasped with a forceps of the Collin pattern immediately on opening the thorax and sufficient traction made to correct the displacement of the mediastinum.

Local anæsthesia is used until the hand is inside the chest, or if the patient is restless, then only light nitrous oxide. The most serious cases can be thus operated upon, and better control of movements

of the lung, mediastinum and diaphragm is permitted. The two-stage operation is only possible with this method of analgesia. Ether should never be used. Unless primary union is obtained, the patient is worse off; hence bold and thorough excision of the wound area is necessary.

After the track of the missile is excised, gloves and instruments are changed and the skin again cleansed and fresh towels applied. When the position of the wound will permit, resection of the fourth rib from the mid-clavicular to the posterior axillary line furnishes the easiest access to the thorax. One must be careful not to increase shock by too powerful a retraction.

Mop out the chest, check fresh bleeding and then look for laceration of the diaphragm. On the right side, excise the track of the missile widely enough to expose the liver, remove the missile if it is in the liver, and cleanse out its track with a curette and a swab wrung dry out of saline and ether. If oozing occurs, insert deep catgut sutures. The very low resistance of the hepatic tissues to infection makes it important to remove all sources of infection. Close the wound in the diaphragm, but do not suture the diaphragm to the chest wall, as advised by DePage. If other viscera of the abdomen are injured, deal with these through an abdominal incision.

Now the lung, held by a Collin forceps, is brought into the opening and the missile or fragment of rib removed and the track in the lung closed, using a non-cutting blunt needle. Partial lobectomy may be necessary if there is extensive laceration. If an open bronchus is found, it can be closed by crushing and ligation. Care should be taken to remove all blood-clots, pieces of cloth, fragments of bone, etc., from the thoracic cavity. This can be done better by sponging than washing out, first with saline, then with warm ether swabs.

Always close the chest unless there is extensive gas gangrene of the lung. Do not waste time on the parietal pleura as it can be included in muscle sutures. The chest must be hermetically closed with the first layer of muscles or else pocketing will occur, pleural effusion accumulate, the incision will break down and the operation fail. Keep a thick sponge in the pleural wound during the entire operation except when the hands are actually in the chest. A 7-inch adhesive strip is of great aid in keeping on the dressing, leaving the sound side free. Keep the patient semirecumbent, inclined toward the injured side.

A two-stage operation is indicated if the exit and entrance wounds are wide apart, where gross lesion of the bone or extensive destruction of the tissues necessitates an extensive operation of both wounds. In such a case, enter the chest through the wound giving freest access to the pleural cavity and to the part probably damaged. Operate as outlined above, but leave the patient on the table surrounded by hot water bottles, giving intravenous sodium bicarbonate or blood transfusion if required, or

sodium bicarbonate and glucose, 8 ounces per rectum. If the patient is restless, give half an ampule of omnopon and then in one to two hours deal with the other side; paravertebral anesthesia is often unnecessary here, only local sufficing. Bilateral lacerations of the diaphragm should be dealt with by a two-stage method.

Injuries of the heart and pericardium are best dealt with by a parasternal flap of the fourth and fifth, or the fifth and sixth costal cartilages, depending on the probable site of the lesion. This route also gives free access to the pleural cavity. If the missile has passed through the pleural cavity and lodged in the mediastinum, especially high up, it is wise to enter the mediastinum through the sternum. Remove the missile, cleanse the bed and track thoroughly and close the pleural opening to prevent any leakage from the mediastinum into the pleural cavity. It is hard to deal with the mediastinum through an ordinary costal incision.

Phrenic nerve injury is the cause of many early deaths on the battlefield.

Postoperative treatment requires frequent change of position, but the injured side should be kept dependent. Give plenty of opiates, also glucose and sodium carbonate, 5 per cent of each. The patient should sip 8 ounces of a 2 per cent glucose solution every two hours. Aspiration is done as a routine after eighteen hours and on the third day. Keep the patient in the open air as much as possible. Explore the chest often to prevent fluid from accumulating. No reliance is to be placed on physical examination, only on the X-ray and exploration.

Good team work between the surgeon, the physician, the X-ray man and the anesthetist is essential.

D. N. EISENDRATH.

Hutchinson, W.: *The Treatment of Wounds of the Chest, with Special Reference to Infected Hæmothorax*. *Brit. M. J.*, 1918, i, 196.

Four classes of chest wounds should be distinguished. They are:

1. Non-infected hæmothorax or pneumohæmothorax.
2. Open pneumothorax.
3. Infected hæmothorax.
4. Foreign body in the lung or the pleural cavity.

Treatment in simple non-infected hæmothorax or hæmopneumothorax consists in merely aspirating the blood from the pleural cavity. This should be done if dullness extends more than two finger-breadths. Of 450 cases in the author's series, 368 were aspirated. A fair sized trocar is used after cocaine anesthesia and a small knife slit in the skin. If there is a large amount of blood clot, the author believes the chest should be opened, the blood and clots aspirated, and tight closure made with a final aspiration of retained air. If blood is allowed to remain a long time, the lung becomes bound down by adhesions and a large proportion eventually becomes septic.

Open pneumothorax is treated by prompt closure after cleansing of the wound and pleura. Shock and danger of infection is greatly diminished by this procedure. If there is likelihood of infection, 1 ounce of 1:1,000 flavine solution is left in the chest.

In infected hemothorax it is impossible to aspirate the clot which contains the infection. It is also impossible to sterilize the clot by any known method. A thoracotomy is therefore done under nitrous oxide and oxygen anesthesia. The hand is inserted, light adhesions are broken down and the clot removed. The cavity is washed out with saline solution and the chest closed, mopping a small quantity of antiseptic over the lung and pleura.

The serum that collects and air left in are aspirated in forty-eight hours. Three or four aspirations are necessary during convalescence. Eusol, "blpp," flavine and saline have been variously used in treating 20 cases in this manner. Certain types of infection seem to lend themselves to this form of treatment better than others. Thus of 11 cases of bacillus aerogenes capsulatus infection, only 3 had to be reopened. Of 7 cases of streptococcus infection, 6 were reopened. Of the whole group of 29 cases, 24 were reopened.

The treatment of a foreign body in the lung or pleural cavity must vary with the three types of hospitals, e.g., the casualty clearing station, the base hospital in France and the base hospital in England. As a result of experience with 450 cases and from reports from other surgeons, Hutchinson is convinced that no attempt should be made to remove a foreign body from the lung while the patient is in a base hospital in France.

Of 27 deaths that occurred in this series, 11 died of septicæmia, and four due to pocketing, all in drained cases. Gas gangrene of the chest wall was present in three cases. C. A. HEDBLUM.

Eastman, J. R.: Wounds of the Thorax in War. *Med. Rec.*, 1918, vol. 234.

Non-penetrating wounds involving the superficial chest coverings may be associated with injury of deep structures. They are cleansed and covered with dry or moist antiseptic dressings. Non-penetrating wounds involving the deeper structures of the chest wall are nearly always infected and may be serious when there is injury of the internal mammary artery, the symptoms of which are: general signs and symptoms of hemorrhage; severe hemorrhage from a wound traversing the course of an artery; difficulty and pain in swallowing; extra pleural hematoma evidenced by flat percussion note; hematemesis absent. The wound should be enlarged by an incision parallel to the costal cartilages and both ends of the vessels ligated. If the ends cannot be found, make other transverse incisions above and below to ligate both ends. Treatment of deep non-penetrating wounds of the chest wall consists in the removal of foreign bodies and the maintenance of antiseptics, to which is

added strapping of the chest to provide immobilization.

Penetrating wounds of the chest wall may be associated with fracture of bone; may involve the pleural cavity, the lung or other organs of the chest. Partial fractures of the rib receive ambulant treatment unless associated with hemothorax or pneumothorax. Complete fracture should be treated in the recumbent posture. Extensive emphysema may be reduced by introducing one or more aspirating needles and allowing them to remain for several hours. In threatened emphysema an incision down to the fractured rib should be made under local anesthesia to allow escape of the air. In penetrating injuries involving the pleura to the exclusion of the lung, the principal symptoms are those of hemothorax or pneumothorax or both, with dyspnea but without hemoptysis. The common complications are pleuritis and empyema. The symptoms in chest injuries involving the lung are those of shock, hemothorax and pneumothorax with cutaneous emphysema, hemoptysis, pain, cough and dyspnea.

The primary treatment of penetrating chest wounds consists of control of external bleeding, cleansing of the external wound, application of a sterile or antiseptic dressing, rest with the chest elevated, heat and morphine. In cases manifesting shock, proctoclysis and subcutaneous or intravenous injections of normal saline solution are to be used promptly. Primary operative intervention for control of bleeding of the pulmonary vessels has in the main given way to conservative or expectant treatment, though some have made thoracotomies. In clean-cut bullet wounds, the preponderance of opinion favors conservatism.

The author then considers the common complications of penetrating chest wounds. Hemothorax may be sterile or septic. Sterile hemothorax is treated in the field by the application of a sterile dressing to the wound, strapping of the chest, and administration of morphine. Later the principal indication of treatment consists in rest in bed. If the accumulation of blood is extensive, then aspiration may be performed. After the danger of bleeding has passed the patients should be exposed to fresh air and sunshine. Absorption may be promoted by electric light baths and breathing exercises. Artificial pneumothorax is recommended in obstinate cases to loosen adhesions and promote absorption.

Treatment of septic hemothorax consists chiefly in thoracotomy with removal of the infected fluid and subsequent irrigation. When empyema is present, thoracotomy with rib resection is required for drainage. Lung hernia when fresh should be reduced by pressure after disinfection of the external wound. If one or more ribs offer resistance to reposition they should be resected. The sudden entrance of air into the pleural space should be prevented by the use of gauze compresses. If the lung hernia is several hours old and the external

lung tissue is collapsed or gangrenous, it may be excised by ligating it *en masse* with silk, then dividing it distal to the ligature with actual cautery.

Concerning pleuritis, pneumonia, and bronchitis it is noted that they appear frequently after chest injury. Lung abscess and gangrene are rare. Extensive lacerations of the heart may occur. Wounds of the pericardium cause hemorrhage with accumulation of blood in the pericardial sac, causing pressure on the heart and symptoms very like injury of the heart itself. Treatment consists in removal of the blood and ligation of the bleeding vessels. Pus in the pericardial sac requires ample drainage.

Injuries of the large vessels of the chest are practically always immediately fatal. Injuries of the thoracic duct often lead to fistula and chylothorax or chylothorax. Wounds of the diaphragm are of interest in connection with associated injury of other organs. Violent compression of the thorax may produce hemorrhages from the small veins of the head and neck with ecchymoses into the conjunctiva and ear-drum. Lodged bullets in the chest should not be removed unless they are superficial or are causing untoward symptoms by their presence.

E. B. FREDRICK.

Dobson, J. F.: A Preliminary Note on the Treatment of Infected Hæmothorax. *Brit. M. J.*, 1918, i, 148.

Dobson says resection of the rib, the evacuation of fluid and clots, the removal of foreign bodies when possible, and immediate closure of the wound is ideal and is being more and more widely adopted at the casualty clearing stations, but is only applicable in the earliest stages of the infection. When symptoms recur, these patients very rapidly become seriously ill. Those cases where infection has passed beyond the contents to the walls of the pleural cavity cannot be treated in this way.

Dobson uses a special silver cannula without a terminal aperture but twelve small lateral holes. The eighth rib is resected, Tuffier's rib spreader inserted, the pleural cavity wiped out, the foreign body removed and other complications dealt with. The cannula is then inserted through the third or fourth interspace about, or external to, the mammary line. The original incision is then closed around a tube long enough to reach into a bottle of antiseptic fluid and the cavity is then irrigated every two hours with Carrel-Dakin solution. The infection is quickly controlled, the lung expands well, and the general condition improves rapidly.

Certainly at present the treatment of badly infected hæmothorax does not give good results. Many cases discharge for a long period and only heal after much falling in of the chest wall or after wide resection of the ribs. If the lung does not expand, the author does not hesitate to reopen the wound, free the adherent lung and close the chest.

D. N. EISENDRATH.

Stoney, R. A.: The Modern Treatment of Empyema by Antiseptics. *Brit. M. J.*, 1918, i, 198.

Acute empyema is easily cured by simple surgical methods. Through neglect or inefficient surgical treatment the lung and diaphragm become covered by granulation tissue which by its further development into fibrous tissue renders the cavity non-collapsible and chronic empyema results. This condition is difficult or impossible to cure even by extensive Estlander or Schele thoracoplasty.

Most if not all cases can be cured without resorting to such dangerous and mutilating operations, because it is not necessary to obliterate the pleura space but merely to render its walls sterile, and this is possible by frequent washings with hypochlorite solution. The treatment is not dangerous provided a free exit for the fluid is provided.

The earlier the treatment is instituted, the sooner and more surely will a cure be obtained. The opening is most suitably made by removing one inch of the eighth rib in the scapular line. Three illustrative cases are reported.

C. A. HEDBLÖM.

Gatellier, I.: Acute Mediastinal Emphysema of Traumatic Origin (L'emphyseme médiastinal aigu d'origine traumatique). *Bull. et mèm. Soc. de chir. de Par.*, 1918, xlv, 74.

Nine observed cases and 11 investigations on cadavers have given Gatellier the opportunity to study the technique, treatment and pathogenesis of mediastinal emphysema. In 200 wounds he has observed 5 cases of acute emphysema of the mediastinum.

The symptomatology of acute traumatic mediastinal emphysema differs from that of acute emphysema which is observed in children in the course of whooping-cough and bronchopneumonia. Gatellier has never observed either obliteration of the intercostal spaces nor crepitation synchronous with cardiac systole in the precordial region. Considerable circulatory disturbance with cyanosis and intense dyspnoea are the fundamental symptoms, with the appearance of gaseous infiltration above the sternum.

A wound of the chest, intense dyspnoea, disturbance of the venous neck and facial circulation, and the finding of an elastic episternal notch cushion without cervicofacial emphysema are, according to Gatellier, the first symptoms which call for immediate surgical intervention.

In 5 experimental investigations of emphysema Gatellier made a direct insufflation of the mediastinum by the eighth intercostal space. He produced a mediastinal infiltration ascending toward the neck. In 5 other cases by producing a subcutaneous emphysema he was not able to produce infiltration of the mediastinum.

He propounds two different pathogenetic theories: (1) when pneumothorax is created in the course of an onset of cough the mediastinal pleural tear is enlarged and a valve is established which causes progressive insufflation of the mediastinum, or (2)

in the region of the pulmonary tear an interstitial emphysema is constituted which in its progression invades the mediastinum. Gatellier especially remarks that mediastinal emphysema always begins with the mediastinum and progresses always from the thorax to the neck.

In treatment Gatellier insists that the only method to remedy emphysema is a direct intervention which permits evacuation of the mediastinal air. A supra-sternal incision alone reaches the mediastinal cavity. He rips the aponeurosis, penetrates the peritracheal and peri-oesophageal anterior and posterior spaces. The technique is described. It must be fully and thoroughly carried out or it will not give results. Both anterior and posterior mediastinal spaces must be reached directly. If properly done, it generally brings about recovery.

W. A. BRENNAN.

TRACHEA AND LUNGS

Tilley, H.: The Treatment of Foreign Bodies in the Lower Air Passages and the Oesophagus, or the Direct Method. *Lancet*, Lond., 1918, CXCIV, 283.

The general term "endoscopy" includes those methods by which a direct inspection may be made of the lower air passages, the oesophagus, and stomach.

The mode of access of foreign bodies to air passages is by inhalation, during ill-timed inspiratory effort, or during anaesthesia or unconsciousness from other cause. Impaired muscular activity or sensation from tertiary syphilis, malignant disease or tuberculous ulceration may be contributing causes. Foreign bodies in the oesophagus are lodged there during swallowing.

There may be no history of the accident. Cough and dyspnoea when present indicate a foreign body in air passages. Difficulty in swallowing points to the oesophagus. A foreign body may be present in the absence of symptoms. A pin impacted in the larynx thirteen years caused only occasional fits of coughing. The only symptom may be a foul breath. A large foreign body in the oesophagus may mislead the surgeon to perform tracheotomy because of dyspnoea and stridor due to pressure on the trachea.

The early symptoms, however, are as a rule sufficiently characteristic and localizing. In general the symptoms are: (1) obstructive, from the size of the foreign body or from spasm; (2) irritative, produced by the presence of the foreign body; or (3) inflammatory.

Foreign bodies lodged in tonsils or pillars of the fauces produce pain of a pricking nature felt most on swallowing. In the pharynx a large bolus of food may lodge and cause difficulty in swallowing and in breathing. Smaller and sharper foreign bodies may cause dysphagia and inflammation. In the larynx intense croupy cough, dyspnoea and aphonia are the common and immediate symptoms. A large

object may produce sudden death by obstruction and by spasm. Small sharp objects lodging in the aryepiglottic folds may cause pain, inflammation or abscess formation.

A small foreign body in the trachea may produce no symptoms, unless it is in the sensitive subglottic region when violent coughing and laryngeal spasm are characteristic. In the bronchus, if there is no obstruction there may be no symptoms until irritation or inflammation is set up. Complete obstruction of the bronchus will involve retention of secretion followed by bronchiectasis, septic pneumonia, abscess or gangrene. Hæmoptysis and pyrexia occur late and are uncommon. Unilateral bronchiectasis in a child should always excite suspicion of a foreign body in a bronchus.

In the oesophagus the vast majority of foreign bodies lodge in its upper third opposite the upper thoracic aperture. A small foreign body may cause obstruction through spasm or through damming back of food. Dyspnoea, cough, and finally a fistula between trachea and oesophagus may result.

In a suspected case, besides the history a local and general examination of the neck and chest, radioscopy and endoscopy must be made. X-ray is of great importance and may help in localization by showing secondary lesions even when the foreign body does not obstruct the X-rays. On the other hand, a metallic body may not show in a stout person.

A general anaesthetic may be used and is indicated where a foreign body is tightly impacted. Local anaesthesia relieves discomfort and minimizes reflex activity. No anaesthetic is used in small children. The patient should lie on his back with shoulders slightly raised and head thrown well back.

An instrument having distal illumination is the best. Strict asepsis, a plentiful supply of swabs, and some form of suction apparatus for keeping the field free of mucus and blood are important in technique.

As a rule urgent dyspnoea demands immediate tracheotomy. The bronchoscope can then be passed through this opening. If dyspnoea persists after removal of the foreign body, intubation or in extreme cases tracheotomy may be necessary. Oesophagoscopy is as a rule not so urgent as bronchoscopy but is definitely indicated in all cases of lodged foreign bodies except in cases of traumatism or inflammation of the oesophagus, in some cases of aneurism or serious vascular lesion, and in cases in too critical a condition to withstand the procedure. The mortality in skilled hands is very low, but the "occasional operator" will be a source of danger to the community.

C. A. HEDBLON.

Tewksbury, W. D.: Treatment of Non-Tuberculous Lung Abscess with Pneumothorax; Report of Ten Cases. *J. Am. M. Ass.*, 1918, LV, 293.

Tewksbury reports 10 cases of abscess of the lung following operations on the nose and throat, treated with pneumothorax. Eight of the cases

were of less than six weeks' duration. Diagnosis of abscess was made in all cases within two weeks following operation. Pneumothorax treatment was begun from two weeks to two months following the time of diagnosis. Two to ten treatments were given at short intervals, during a period of two weeks to two months. Six of the patients were cured and two died, one from rupture of the abscess into the pleural cavity. The presence of pleural adhesions was probably the cause of the rupture.

Two chronic cases, of one and two years' duration respectively, were also treated but without material benefit.

C. A. HEDBLUM.

Piéry, M.: *War Injuries of the Lung* (Le poumon de guerre). *Rev. gen. de path. de guerre*, Par., 1917, No. 5.

Piéry points out that whereas before the war surgeons approached the lung in a more or less timid fashion, they have become bold and sure as a result of the recent experience gained by them in war surgery.

Practically all war wounds are caused by projectiles of one sort or another; very few stab wounds are described up to date. These projectile wounds can best be considered under the following five heads:

1. Simple chest wounds with hæmopleuro-pneumonic symptoms.
2. Complicated chest wounds.
3. Etiological and pathological factors.
4. Symptomatology of chest wounds.
5. Treatment of chest wounds.

Under the first head of simple chest wounds, Piéry says that the really striking thing is the fact that simple war wounds are practically always accompanied by a definite symptom complex, the only variation being in the intensity and duration of the symptoms. This symptom complex he has called syndrome hæmopleuropneumonic, because anatomically it is characterized by hæmothorax with an accompanying pneumonia.

There is first shock immediately followed by dyspnoea, both of varying intensity, and followed in turn by more or less inconstant hæmoptysis, rarely profuse. The following day there appear physical signs that are quite striking in their constancy. Over the lower third of the lung posteriorly there is flatness, absence of voice sounds, absence of or diminished breath sounds; from the middle third, dullness with normal or exaggerated voice and tubular or almost tubular breathing.

The radioscopic examination shows a large, dark shadow replacing the clear lung area ordinarily seen under normal circumstances, which extends over the lower two-thirds of the wounded lung. This shadow fades out gradually with no tendency to demarcation into two zones. This X-ray examination may also disclose a projectile.

Exploratory aspiration (indispensable in these cases) confirms the diagnosis. A cell count of aspiratory fluid shows: (a) a gradually rising polymorphonuclear leucocytosis during the first five

or seven hours, followed by (b) a drop in the number of leucocytes due to dilution of the blood and lasting four to thirty hours, followed by (c) increase in leucocytosis, but chiefly of the eosinophile and mononuclear variety. This last phase ushers in the absorption and lasts eight to twenty hours.

Hæmoptysis, immediate, delayed and secondary, cough, and dyspnoea require no special description. The elevation of temperature which occurs in these cases, however, merits special mention because it is one of the most characteristic symptoms. It begins within twelve to twenty-four hours, and then after the third or fifth day maintains a height of about 101.5° to 102.5° F. for about fifteen days. Defervescence occurs by lysis and is usually completed in about three weeks.

These cases may clear up completely, the physical signs or remnants of them existing from three to five weeks, if the patient is in good physical condition, or the patient may pass into the more serious form with a marked elevation of temperature, lasting from four to six weeks, without any confirmatory evidence of empyema or other intercurrent affections. This fever is due to pneumonia. Piéry insists that the symptoms are due to pneumonia, even if the symptoms be lacking and physical signs not in evidence. Cases of this type will frequently drag along from six to eight weeks.

The significant fact is that both the mild and severe cases, provided there are no complications, always terminate favorably. Piéry treated twenty-five patients with simple penetrating wounds, with one hundred per cent of recoveries. This does not mean that there is complete *restitutio ad integrum*, for about one-third of these cases develop recurrent bronchitis and many of them have more or less persistent chest pains, dyspnoea on effort, dry cough, and general irritability over quite a long period of time. In general, however, over fifty per cent of the cases lead active lives and are fit for army duty.

Under the head of complications of penetrating wounds of the lung may be considered immediate complications and remote complications. Immediate complications are fairly well known, having been well described by the medical men at the front. The remote complications, seen mostly by the personnel of the base interior hospitals, have been less accurately described.

Of the immediate complications, the three most important are: (1) pneumothorax; (2) secondarily infected hæmothorax; (3) primary pyopneumothorax.

The less significant complications are accompanying abdominal wounds, abscess of the lung, abscess of the mediastinum, fracture and osteitis of the ribs.

Pneumothorax is extremely frequent, occurring in about 47 per cent of the cases seen by Piéry. The striking fact is how frequently partial pneumothorax occurs without playing any part whatsoever from the point of view of symptomatology. As a

rule, the pneumothorax is, of course, due to escape of air from the lung substance. Much more serious is the type of pneumothorax due to a gaping wound of the chest wall. This type of pneumothorax is almost always total, and almost always results in infecting the pleural cavity, setting up acute empyema.

The secondarily infected hemothorax occurred in about thirteen per cent of Piéry's cases, and manifested itself by a recurrence of fever about the third or fourth week. The exploratory aspiration serves to differentiate this condition from the fresh pneumonia. It is unnecessary to add that this condition is much more serious than is pneumothorax.

The primary pyopneumothorax may be partial or total. The partial ones are very difficult to diagnose. X-ray, however, aids a great deal in reaching a conclusion concerning them and exploratory aspiration is invaluable. The total pyopneumothorax occurs usually with severe infections of the pleura and is always of grave prognostic import.

Piéry devotes only a few words to what he has already referred to as the "other less significant complications of penetrating wounds of the chest." Under the head of remote complications are considered: (1) late hamoptysis; (2) abscess of the lung; (3) gangrene of the lung; (4) late pneumonia; (5) accidents which are followed by rapid, sudden, unexplained death, possibly related to the accidents which in civil surgery are grouped under the head of "accidents due to pleura reflex."

Under the head of pathology, Piéry emphasizes again the constancy with which simple wounds of the chest are accompanied by pneumonia, explains the mechanism of the development of pneumothorax, early and late hamoptysis and the mechanism of infection by bacteria from lung substance, chest wall, projectiles and other foreign bodies.

Under the head of symptomatology, Piéry emphasizes the points already made regarding the characteristic temperature and other symptoms and physical signs, and the rôle in diagnosis of X-ray and exploratory puncture, emphasizing the importance of reaching a diagnosis at the earliest possible moment.

Prognosis of the simple penetrating wound is very much better as regards life than one would be led to imagine. In Piéry's experience, this type of wound has been attended with far better results than wounds of the femur, and on the whole, has been astonishing in its benignancy. His mortality has been 9.4 per cent, the mortality of Maisonneuve 20 per cent, and that of DePage and Janssen 15.3 per cent. Piéry emphasizes that in speaking of this low mortality rate he is considering only the simple penetrating wounds of the chest and not those serious accidents accompanied by injury to the heart and large vessels. Another interesting fact is that pneumothorax, even the total pneumothorax, does not seem to influence the prognosis

unfavorably. Indeed, pneumothorax may be looked upon as a beneficial symptom in that it compresses the lung and checks bleeding. The two gravest prognostic elements are the large open chest wound and generalized infection. It is well to call attention to the significance of the pulse in prognosis; Piéry states that a pulse which alters from about 100 beats to the minute to a rate of 120 to 130 with slight irregularity is a sign of the gravest possible significance.

Treatment of penetrating wounds of the chest is divided under the heads of immediate treatment, consecutive treatment, and treatment for complications.

Immediate treatment has to do in the first place with assuring rest during transport and during the stay at the regimental aid station and at the evacuation hospital. Transport over any appreciable distance is contra-indicated. After application of the first aid dressing, one limits his efforts to combating the tendency to collapse, the dyspnea and pain by morphine. As a matter of fact, the chest should be immobilized on the injured side, but Piéry says that one should not worry if the immobilization is not very thorough, because there are few bad effects caused by transport over an ordinary distance.

As to the treatment of the thoracic wound itself, Piéry says that it cannot be insisted upon too strongly that one should not practice excision of the wound. Gasquet and LeNouene agree with this advice. Of course this is contrary to the usual method of handling wounds, but except in very rare cases, such as subcutaneous hematomata which harbor infection, abscess of the pleura requiring opening, or late pneumothorax, excision of the wound is dangerous.

The opening caused by a foreign body passing between the ribs frequently closes itself immediately. If this wound be excised, a portal of entry is created for infection of the pleural cavity. DeMartell makes this same statement in regard to penetrating wounds of the skull, in which the points of entry and exit are closed. The extraction of foreign bodies in the chest wall can also be left for a later date. In the treatment of these cases, one should bear in mind the great danger of pulmonary congestion and try to combat this with suitable drugs. Ipecac and digitalis seem to be the most appropriate ones.

The so-called consecutive treatment comprises merely the treatment from the time the emergency treatment has been looked after, the important feature of course being the question of operation, which will be discussed later.

Treatment of complications is limited to the treatment of hemothorax, pyothorax, pneumothorax and intrapulmonary projectiles.

Regarding the indication for operation, it is unfortunately true that the early optimistic reports regarding the safety of lung surgery must in a measure be modified, in other words, one must

bear in mind that surgery of the lung, in spite of the remarkable recent advance, is still surgery of a very grave sort. For this reason, largely, Piéry states that one has no right to assume that every foreign body in the lung must of necessity be extracted. Rather, the needs of removal should be based on some complication referable directly to the foreign body. The most urgent indication is hæmorrhage. Pulmonary abscess is another indication. Finally, there is to be determined the important fact of whether a pneumonic process is dependent on the foreign body.

The best time to operate is in the so-called interval after the hæmopleuripneumonia has abated. Piéry says that the situation is very much the same as the one confronting the surgeon in cases of appendicitis: it is always desirable to operate in the interval if possible, but the surgeon should never hesitate to allow his hand to be forced by threatening symptoms. As a general rule, extraction of foreign bodies should be considered as an operation to be performed in interior hospitals rather than in the hospitals at the front.

Piéry describes the technique of Marion, of de Mauchaire, of Villion and of Duval. Of these, he selects that of Duval as the most suitable and characterizes it as "harpooning" the portion of the lung. In brief, the technique of Duval consists in resection of one rib, extensive retraction of the wound, evisceration of the lung, location of the projectile, removal of the projectile through an incision made into the lung if it is easily located, and suture of the lung wound.

Piéry closes his article with a discussion of the indirect injuries of the lung due to concussion. Unfortunately, however, aside from merely stating that these injuries do occur and that they are characterized chiefly by hæmorrhage, he admits that

so far there has been no theory satisfactorily explaining these indirect injuries.

PHARYNX AND ŒSOPHAGUS

Perkins, C. W.: Diverticulum of the Œsophagus and Pseudo-Diverticulum of the Descending Colon. *Hosp. Bull. Dept. Publ. Charities, N. Y.*, 1917, 1, 98.

Gastro-intestinal roentgenology has brought to light pathological conditions of the alimentary tract formerly considered rare but now observed to be of comparatively frequent occurrence. Diverticula of the Œsophagus, non-ulcerative diverticula or hernia of the stomach and diverticulitis of the sigmoid are among such conditions.

The author has seen a diverticulum of the stomach, holding at least a pint, diagnosed by roentgen ray and operated upon by Walther at the Hospital La Pitié, Paris, in 1914.

A case is reported of a patient aged forty-five, with cough and bronchitis, good appetite, but having gastric distress. There was a specific history with treatment. The Wassermann test was now negative. In 1908, following an attack of pneumonia, she first noticed regurgitation of medicine and food which would occur sometimes ten hours after ingestion. She was treated for nervous dyspepsia and cardiac spasm.

Fluoroscopic and radioscopic examination in the vertical position showed a retention of four or five ounces of barium mixture. Only on changing to a recumbent position did it overflow and proceed down the Œsophagus into the stomach. The diverticulum was at the level of the sternoclavicular articulation. The patient refused to undergo a complete examination. The treatment is not recorded.

C. A. HEDGECOCK.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Chalier, A., and Glenard, R.: Penetrating Abdominal Wounds (Plaies pénétrantes de l'abdomen). *Rev. de chir., Par.*, 1917, lxx, 124.

Of 1,500 important wounds observed in the authors' surgical ambulance, 39 were assured cases of abdominal perforating wounds, viz. 2.6 per cent. These 39 cases were distributed as follows: simple penetrating wounds, 4; univisceral penetrating wounds, 29; multivisceral penetrating wounds, 6.

The first part of the authors' study comprises the pathology, symptoms, diagnosis, complications and progress. The authors discuss all the symptoms, but point out that there is no pathognomonic symptom of a penetrating abdominal wound. It is only the presence of several signs which transforms probability into certainty, and if the surgeon awaits certainty he runs the risk of operating too late.

The authors had 19 deaths in the 39 cases treated. Of 11 medically treated there were 4 deaths. In these 4 cases an early operation was impossible owing to the patient's condition. Besides these 4 there were 7 abdominal wounds with certain penetration which were evacuated without surgical intervention. The cases treated surgically gave 15 deaths. The greatest mortality was in those treated by the Murphy operation. There were 14 such operations with 10 deaths, a mortality of 71 per cent. The authors give the statistics of several authors for this operation which show a mortality of 76.84 per cent.

For the purpose of comparison of intervention and abstention in abdominal wounds the authors give statistical tables of the results obtained by several reporters. The statistics of 29 abstentions show a mortality of 77.3 per cent. The statistics of 39 interventions give a mortality of 59.5 per cent.

The difference is clearly in favor of immediate intervention.

It is however important in treating abdominal wounds that operation be effective be early. If operated upon within the first six hours after injury, the chances of recovery are more than doubled. In the first six hours there is peritoneal sepsis. In the first three hours the prognosis is even better.

A late operation is almost certain to be a failure. Abstinence is only indicated in cases where the patient comes very late and shows no symptoms which give a manifest reason for intervening surgically. The author condemns the blind drainage of the Murphy method.

The operation in the case of abdominal wounds should be a wide laparotomy which allows careful exploration and as complete repair of all lesions as possible. It should be done by a skillful experienced surgeon who has all the necessary equipment at his disposal. The treatment of abdominal penetrating lesions may be summed up as follows: Early systematic operation is preferable to abstinence if conditions are satisfactory. Success will depend especially on good transportation and rapid evacuation from the front line formations.

W. A. BRENNAN.

Stoppato, U.: The Pre- and Postoperative Treatment of Abdominal Wounds (Il trattamento pre- e post-operatorio dei feriti dell' addome). *Policina*, Roma, 1917, xxiv, sez. chir., 473.

The author says that the treatment of abdominal wounds is not alone a surgical problem, but essentially a medico-surgical problem. Such cases usually reach the surgeon in more or less marked shock. They should receive at once a subcutaneous injection of 1 or 2 cc. of morphine, and then means should be applied to increase the blood-pressure and the patient's vitality.

For this the author uses camphorated oil, adrenalin, and salt solution. The camphorated oil is administered subcutaneously after the morphine in doses varying from 3 to 4 ccm., injecting at the most 2 ccm. at the same point. Such injections are usually made in the first quarter of an hour after arrival. Adrenalin is also administered subcutaneously in doses of 1 or 2 ccm. of a 1:1,000 solution. The serum may be administered hypodermically or intravenously.

Means to combat hypothermia should be used. If the shock is slight, it is not necessary to await the effects of the injections. If the shock is severe but susceptible to treatment, the effects will be observed within thirty to forty minutes and this amount of delay before operation will usually suffice. If the shock is very severe, the patient should be permitted to rest for not exceeding two hours, the stimulant being repeated at sufficient intervals as deemed necessary. If after two hours there are no signs of recuperation, it is better to abandon the idea of operation.

It will be necessary during the operation to

combat the additional operative shock by continuing the injections at intervals.

In the postoperative treatment the position of the patient is important. The Fowler position is not indicated in all cases; certain cases may require a lateral decubitus or even a horizontal position with the head pendent, especially when there has been abundant hemorrhage and threatening anemia.

The circulation will need careful watching; the author continues the camphorated oil and adrenalin injections alternately; but the use of morphine is restricted as the author is not convinced that it is harmless.

Food and all drink is forbidden for the first twelve hours. Then only a spoonful of milk and water, brandy, or wine with water is given every hour.

To overcome abdominal meteorism enemas of equal parts of warm water and glycerine are used. This should be personally administered by the physician in the manner described by the author. After expulsion of gas, the intestine is cleansed with warm salt water. Other points regarding diet, etc., are detailed.

In true abdominal wounds which have been operated upon, the author has never observed recovery by first intent. He thinks that this is explained by the fact that septic matter is carried by the projectile into the intricacies of the intestinal wound which contaminates the walls during operation.

W. A. BRENNAN.

Bloodgood, J. C.: Some Hernias That Disqualify for Military Service, Whether Operated upon or Not. *J. Am. M. Ass.*, 1918, lxx, 515.

There is a small group of hernias for which at the present time operations have failed to result in cure in from 20 to 50 per cent of cases. Among 243 cases of inguinal hernia, this type occurred in 11 instances, about 4.5 per cent. Among these 11 cases there were 6 recurrences, more than 50 per cent, in from six weeks to six months after operation.

This type of hernia can be recognized when the patient is examined lying flat on his back. If the finger is pressed against the scrotum and pushed up into the external ring, as the index finger passes through the external ring, the hernia having been reduced, in the larger number of cases it meets an obstruction (the conjoined tendon) and is deflected upward and outward, following the course of the inguinal canal. In this smaller group the index finger meets no obstruction, but enters at once into the peritoneal cavity, and in some cases the opening is so large that when the index finger is flexed it can palpate the pubic bone in the region of the symphysis.

In those cases in which this examination detects the complete absence of the conjoined tendon, the ordinary operation for inguinal hernia, according to Bloodgood's investigations up to 1899, failed to cure in about 50 per cent of the cases. Later observations of these cases have shown that the per-

centage of recurrences has been reduced to about 15 or 20. It is the author's opinion that it is possible to select this group at the complete examination at the cantonment, and these applicants or registrants should be rejected, saving the government the expense incidental to the operation and later discharge for recurrent hernia. F. G. SKILLERS, JR.

GASTRO-INTESTINAL TRACT

Hernaman-Johnson, F.: The Value of Information Furnished by the Opaque Meal in Disorders of the Alimentary Tract. *Med. Press*, 1918, CV, 191.

This article is largely a refutation of certain statements made by Lewis in an article on "The Principles of Treatment in Indigestion" which appeared in the *Medical Press* on January 16, 1917. The fallacy of supposing that the inhibitory effect of the bismuth meal on peristalsis vitiates the findings in regard to the motility of the gastro-intestinal tract as disclosed by the roentgen ray is especially emphasized. The author points out that for the same type of meal, administered under standard conditions, there is a normal rate of progress through the alimentary tract. Any marked deviation from that rate may serve as a basis for the determination of functional or organic disturbance. In addition, alterations of position or deformities of outline in the hollow viscera may be disclosed with the aid of the opaque meal and the roentgen examination, which are of greater importance than motility. ADOLPH HARTUNG.

Willan, R. J.: A Note upon a Helpful Diagnostic Sign in Ruptured Digestive Ulcers. *Brit. M. J.*, 1918, I, 142.

Several years ago the author saw a patient who had had many sudden attacks of acute abdominal pain which passed off just as suddenly. At the time of admission the patient was suffering from acute general abdominal pain of several hours' duration; this, with the board-like rigidity of the abdominal wall, indicated rupture of an intra-abdominal viscus. At operation a ruptured duodenal ulcer was found.

The feature of the case that impressed the author was the presence of a transverse ring of constriction across the abdomen at the level of the lower margins of the ribs and extending into the flanks on either side.

The constriction is usually present and does not always disappear with general anesthesia, although it does disappear when the condition has advanced to the stage of general abdominal distension. There is no marked hyperesthesia, and the patient is quite unconscious of any feeling of tightness at the site of the constriction. It is not confined to spare or emaciated persons, and is a different thing from the scaphoid abdomen seen in emaciation. The appearance is as if an invisible rope was constricting the abdomen. It may be that it is an

attempt of nature to limit the effects of the perforation to the upper portion of the general peritoneal cavity. The sign was present in the author's last two cases of ruptured ulcer. The ring of constriction corresponds to that portion of the abdominal wall supplied by the ninth intercostal nerve, and is certainly due to muscular contraction.

The muscles involved are the two recti abdomini, external oblique, internal oblique, and transversalis. V. C. HUNT.

Daignault, O.: Gastroptosis and Ptosis of the Transverse Colon. *J. Lancet*, 1918, XXXVIII, 75.

Gastroptosis, or ptosis of the stomach and ptosis of the transverse colon, is a disease to which the general practitioner gives very little attention. The literature on the subject is very meager, but most authors take it for granted that when one organ shows ptosis, there is a general ptosis of all the abdominal organs. Daignault claims that one may have a ptosis of the transverse colon and stomach together without a general ptosis of the liver, spleen, and kidneys.

The author gives a description of the anatomy of the supports of the stomach and states that Glenard, who was the first to give a good description of this affection, thought that the transverse colon was the starting point. He maintained that the transverse colon is fastened to the pyloric end of the stomach by a band or ligament, that the accumulation of feces in the transverse colon causes it to sag somewhat, and this sagging of the transverse colon exercises traction on the pylorus, thus causing the descent of the stomach.

The symptoms of the disease vary more or less. Ptosis may be present without many symptoms, although most of the patients complain of pain in the epigastrium after eating, a dragging sensation in the abdomen and some backache. Most of them are nervous, neurasthenic, and discontented, complaining a good deal of weakness, a tired feeling, and constipation. These symptoms are very likely due to absorption from accumulation in the transverse colon. Hypoacidity usually exists. There is not much regurgitation of food or gases after meals.

He states that the diagnosis is usually difficult, as the cases do not always present gastric symptoms, but instead the patients complain of a good many troubles throughout the body. He suggests the X-ray as the best means of diagnosing these cases. The radiograph should be taken with the patient standing to show the position of the stomach and colon.

In the treatment of these cases most surgeons and medical men admit that suspension of either the stomach or colon shows good results only in a few select cases. The author states that these cases are best treated in a hospital. They should be put to bed with the foot of the bed elevated, so that the organs have a chance to get into their normal position. They should never be allowed to sit up while under treatment, except to be raised

a little at meal time. Overfeeding should be the main treatment. These patients after a few days take easily six feedings a day, three good meals and three lunches. They should also be given daily massage to help the metabolism. They should be given this treatment for a period of from six to eight weeks, or until the weight has increased from 20 to 25 pounds. No medicine except a general tonic is given. After they get up, they should be fitted with a corset or band to help the abdominal muscles.

Daignault thinks that if these cases are better studied, a class of cases heretofore classified as neurasthenics will be greatly benefited.

G. W. HOCHBERG

Boas, I.: Occult Hæmorrhages. *Muenchen med Wochenschr.*, 1917, lxi, No. 23.

Boas investigates the significance of occult hæmorrhages in carcinoma of the digestive tract. No matter what the treatment of such carcinoma, it presupposes an early and exact diagnosis.

Although the roentgenologic method is preferred by many, the number of those who urge the great value of occult hæmorrhage in the diagnosis of stomach carcinoma is continually increasing.

The present report of Boas is based on a very large amount of material not only concerning carcinoma of the stomach but also concerning carcinoma of the rest of the digestive tract. This clinical material dates from 1910 to 1917. There are 109 cases, 90 of the stomach, 12 of the œsophagus and 7 of the colon. In all the cases, the diagnosis was verified by biopsy or autopsy. In the 90 stomach carcinomata, occult blood was found in the feces in 95 per cent and in the gastric contents in 62 per cent. In 56 cases of stomach carcinoma which related to the period of the war and which were directly examined by Boas, occult blood was without exception present in the feces and in 78 per cent of the gastric contents.

In the 12 cases of œsophageal carcinoma, there was occult blood constantly in the feces. In the 7 colon cases, blood in one case could be observed macroscopically and occult blood was constant.

With regard to the question whether carcinoma of the gastro-intestinal tube can be excluded if there is a constant absence of occult hæmorrhage, Boas, on the basis of his own clinical experience and numerous biopsies, thinks that when the search for occult blood is constantly negative both in the feces and in the gastric contents, it speaks with great probability against a carcinoma of the gastro-intestinal tract.

Boas discusses the distinction between occult blood proceeding from ulcers and that proceeding from neoplasms. Diagnostic errors between ulcers and carcinoma of the stomach were frequently made by Boas in early years, but in the past three years, with the greater security of judgment of occult hæmorrhage joined to sufficient bedside observation, such errors are infrequent.

Boas thinks that the search for occult hæmorrhage as a method of diagnosing carcinoma of the stomach and œsophagus which will be of the very greatest advantage to all practitioners. When the method comes into general use, patients with such carcinomata will reach the hands of the surgeon earlier and hence there will be a much better prognosis than at present.

W. A. BRYSON

Kelly, R. A.: Intestinal Toxæmia of High Obstruction. *J. Am. M. Ass.*, 1918, lxx, 512.

The author reports in full the history of a case of obstruction high in the jejunum occurring in a soldier, aged twenty-three. The obstruction was caused by a intussusception having its origin in a papilloma which was discovered at autopsy. The course of the disease was eleven days from date of admission to death.

The physical signs were indefinite; nausea, hicoughs and vomiting of large quantities of bile-stained material were the prominent abdominal symptoms. There was marked headache with an ever increasing profound toxæmia without delirium and without meningeal symptoms. The temperature ranged between 97 and 98 degrees. During the course of the disease the bowels moved freely three times and the day before death they moved copiously after the administration of magnesium sulphate.

The patient remained rational, felt cold and chilly until a few hours before death when he became unconscious without delirium. Respirations were very shallow but not rapid; the pulse was regular and of fair volume, the extremities blue, cold, and dry. There was no evidence of shock or collapse and there were none of the symptoms of active uræmic toxæmia. An intense asphyxia upon which the usual stimulants had no effect was the main phase. The blood was negative for malaria, negative on culture; leucocyte count was 6,000.

The necropsy disclosed the intussusception due to an adenoma of the jejunum. The cause of death was given as duodenal toxæmia due to high obstruction, acute hæmorrhagic jejunitis and terminal hypostatic pneumonia.

The author believes that the absence of delirium, of meningeal irritation and of collapse rules out hepatic or uræmic toxæmia in this case. The high degree of asphyxia puts the etiologic toxin in the class of potent chemicals.

ELIAS FOWLER

Mackenzie, H. W. G., and Battle, W. H.: Some Remarks on Intussusception. *Lancet, Lond.*, 1918, cxlvi, 215.

Mackenzie says that the frequent performance of abdominal operations during the past few years has brought a considerable increase in knowledge of the more rare conditions which threaten life, especially the acute diseases which are often curable if the patient will permit early operation. Intussusception is a striking example of this.

He states that the old classification of the varieties of intussusception by Leichtenstern must be ex-

panded. He wrote of: (1) invagination of the death struggle, an unimportant cadaveric incident; (2) inflammatory invagination taking place without exception from above downward.

Mackenzie suggests the following classification:

1. Acute, which may be divided into (a) simple, which may be single or multiple; (b) compound, where the primary invagination was enveloped in a second passing in the reverse direction; (c) complicated, in which intussusception has been caused by a new-growth.

2. Chronic. Usually enterocæcal or enterocolic.

He quotes cases illustrating each variety. He mentions one case to show that the diagnosis of chronic intussusception is sometimes difficult. The patient complained of noises in his abdomen, especially after meals, for two or three weeks, but had no pain, constipation, nausea, or vomiting. Five weeks after the onset, about one hour and a half after lunch, a swelling was seen to form in the upper and inner part of the right iliac fossa. There was much visible peristalsis with borborygmus. X-ray plates were made which showed no evidence of organic obstruction. He was operated upon seventeen days later. A greatly distended and hypertrophied ileum was found. The ileocæcal angle including the cæcum and about seven inches of the ileum were resected and the appendix, which contained a concretion at the tip, was removed. The patient made an uninterrupted recovery.

The most interesting point of this case is that although the lumen was contracted, practically the only symptom exhibited was the noise produced by the gurgling of the liquid and gaseous contents of the dilated small intestine through the narrow channel of the intussusception.

G. W. HORTON.

Christopher, F.: Myoma of the Intestines. *N. Y. M. J.*, 1918, cvii, 120.

The infrequent occurrence of myomata of the intestine and the important rôle which such tumors occasionally may assume seem to the author to warrant the reporting of this case.

The patient was a female, married, 28 years old. Physical examination was negative save for fixed pupils, impairment of the left apex, relaxed perineum and retroversion of a small uterus; the Wassermann reaction was positive. Urinalysis was negative.

An operation was performed for chronic appendicitis and for retroversion of the uterus. During the course of the operation a nodule 3 cm. in diameter was noticed attached by a pedicle 2.5 cm. long by 0.8 cm. in diameter to the anterior aspect of the sigmoid flexure. The nodule was a yellowish white and seemed to have a thick wall. The pathological report was degenerated myoma of the intestine. The capsule was thin but dense.

The section of the tumor showed it to be a myoma. The origin of these tumors is uncertain. Steiner, who analyzed 51 cases of myomata of the intestine, claims 41 per cent were attached to the stomach,

and in 50 per cent they were equally divided between the large and the small intestine. The age varied from seventeen to eighty years, and the size from one to forty centimeters; some weighed as much as seven kilograms. Not infrequently they are the cause of obstruction or intussusception.

F. C. ROBTISHER.

Miller, H. T.: An Unusual Case of Malposition of the Appendix. *J. Am. M. Ass.*, 1915, lxx, 23.

The author records the case of a four year old boy who appeared to be suffering from a typical attack of appendicitis. The child was removed to the hospital for immediate operation. Under anæsthesia a mass at McBurney's point was readily discernible; when the abdomen was opened, it proved to be the cæcum. Diligent search for the appendix failed to reveal any trace of this organ; furthermore, the cæcum and ileum were smooth and free from any adhesions which might have buried an appendix.

Within the cæcum, however, a movable mass was palpable. This mass was apparently attached to the cæcum at a point corresponding to the usual location of the base of the appendix. Further abdominal exploration was negative. The wound was closed.

The patient was very ill until the fourth day when there appeared in the stool a thick, purulent and very offensive discharge. After this the patient made an uneventful recovery, except that on the tenth day a yellowish green slough was passed which the author took for the misplaced appendix.

R. B. BETTMAN.

Jacobson, I. H.: Left-Sided Appendicitis in Situs Inversus Viscerum Totalis. *Am. J. Obst.*, N. Y., 1917, lxxvi, 953.

The author relates the particulars of a case of genuine left-sided appendicitis associated with total transposition of the abdominal viscera, in a young man of twenty-four years. The patient had three days of acute abdominal pain with a history of similar previous attacks. During the physical examination it transpired that the patient had been told a number of years previous that his heart was on the right instead of the left side. The nature of the conditions had been more or less obscure, but this information enabled a diagnosis of left-sided appendicitis to be made after further examination had verified the truth of the statement.

Incision was made through the left rectus muscle. The appendix was found perforated and gangrenous, hanging over into the pelvic cavity and attached to the left side of the pelvic wall. It was removed and a drain placed. Recovery was uneventful, but three weeks later the patient developed severe abdominal pain again. The abdomen was opened and a dense obstruction found in the small intestine as a result of adhesions in the pelvic cavity. A lateral anastomosis was done, but the patient died the following day.

The author has found eleven cases besides his own in an exhaustive search of the literature. In only three cases was a previous diagnosis made and the appendix removed through an opening deliberately made on the left side. W. A. BRENNAN.

Pury, G. A. C.: *Intestinal Plicature in Affections of the Ascending Colon* (Rôle de la plicature intestinale dans les lésions chroniques du colon ascendant). *Paris méd.*, 1917, vii, 337.

Pury gives the details of four cases to show that the appendix is often held responsible for colon troubles which are due to other factors, and often the appendix is removed, leaving those troubles untreated. Very often the site of trouble is the angle of the colon just below the liver. There may be more or less constriction here with abundant adhesions. A train of lesions may have this as their origin and such lesions may involve the gall-bladder, the pancreas, and even the kidneys. The stagnation of feces with secondary infection is always the primary trouble, starting inflammation of the intestinal wall and entailing atony of the cecum and abnormal distention. The correct diagnosis as a rule can only be obtained after careful roentgenoscopy.

In operating, it is immaterial what technique is followed, provided: (1) that it reduces the abnormally distended cecum; (2) that it frees the intestine from adhesions; (3) that it re-establishes the right colic angle and clears the fecal circulation obstructed by pathologic conditions.

W. A. BRENNAN.

LIVER, PANCREAS, AND SPLEEN

Behrend, M.: *Some Observations on Gall-Bladder Disease and Its Surgical Treatment.* *Med. Rev.*, 1918, viii, 147.

Jaundice is not a common symptom of gall-bladder disease, but "a constant muddy or brownish complexion, without any other symptoms, is indicative of gall bladder disease." Pain also is a variable symptom and may manifest itself either as a dull uncomfortable sensation in the epigastrium and referred to the back, or often as a constant burning pain in the epigastrium and referred to the region of the gall-bladder. Often no pain has been experienced, and yet gall-stones exist.

The differentiation from duodenal ulcer is often easy on account of the hunger pain, its occurrence two hours after eating and its relief by the ingestion of food. Greater difficulty arises in differentiating gall-bladder disease from a high appendix. The error surgically is not great, however, since the appendix can be removed through the same incision.

Gall-stone colic will often stimulate labor pain in the later months of pregnancy.

The author is of the belief that toxæmia, infection, stasis or a high cholesterol content has a bearing on the formation of gall-stones.

"One never finds a diseased gall-bladder without a diseased appendix," says the author, and goes on to say that infections of the gall bladder may be secondary to infections of the appendix. It occurs perhaps by lymphatic extension or by continuity or contiguity on account of close relationship. Other avenues of infection may be either the common duct or the blood. The author doubts the possibility of direct infection through the common duct, "on account of the sterile condition of the contents of the duodenum."

The cholesterol test has been found of considerable use in differential diagnosis. The author states, "In 100 cases of suspected gall-bladder disease operated upon, there was a high cholesterol index in 98 cases, all of which revealed gall-stones."

The X-ray is of little help in the diagnosis. Gall-bladder disease is a surgical condition and prolonged medical treatment leads to complicating changes in the pancreas, carcinoma of the gall-bladder, and secondary inflammation of the pancreatic lymph-nodes. Diabetes may even be secondary to neglected cases of gall-bladder disease on account of changes in the pancreas, the author asserts.

Behrend advocates removal of the gall-bladder, because "a gall-bladder once diseased is always diseased." He believes the better method is stripping the gall-bladder from below up. This method limits bleeding, since the cystic artery is clamped. He concludes with the statement that recurrence after cholecystectomy is less than 2 per cent, while cholecystostomy shows about 15 per cent recurrence.

M. A. BERNSTEIN.

Nuzum, F.: *The Diagnosis of Infarction of the Entire Spleen.* *J. Am. M. Ass.*, 1918, lxx, 282.

Nuzum states that the symptoms of infarction of the entire spleen are pain, tenderness in the left hypochondrium, enlargement of the spleen, occasionally fever, and vomiting of blood due to rupture of dilated gastric veins. Whenever the spleen becomes totally infarcted, enlargement occurs, the weight varying from 500 to 1,500 gms., and the dimensions reaching such proportions as 25 by 15 by 8 cm.

The presence of fever apparently depends on the disease to which the spleen alterations are concomitant. In one of the four cases reported by Nuzum the proteus mirabilis, and in another the colon bacillus was isolated from the spleen and in each case a rise in temperature of from one to two degrees was present intermittently.

Vomiting of blood, bright red at times and at other times resembling coffee grounds, is of frequent occurrence.

In the etiology of total infarction of the spleen vascular obliteration has been held responsible, but the cause of the vascular obliteration must be determined. The important factors here concerned are pressure on the walls of the splenic vessels by tumors; torsion of these vessels in instances of

ectopic spleen, thrombosis of the splenic vessels, and embolism.

The pathology of total infarction of the spleen does not differ from infarction in any viscus that has a "terminal" blood supply. In each of the four cases reported the spleen was entirely necrotic, resembling a bag filled with purulent material. In two of the four instances bacteria of a low virulence was isolated from this material.

In discussing splenic thrombosis one must consider the possibility of a relationship between this condition and the so-called Banti's disease. Authorities differ on Banti's disease. Senator maintains that splenic anemia cannot be differentiated from Banti's disease during the first stage of the latter, and Gilbert and Lereboullet, after a thorough review of the subject, decide that Banti's disease does not exist.

Nuzum summarizes his paper as follows:

1. Total infarction or necrosis of the spleen has been infrequently reported.

2. Total infarction of the spleen may result from an embolus or a thrombus in either the splenic artery or the splenic vein; from the extension of a thrombus backward from the portal vein into the splenic vein; from pressure on the splenic vessels by a neoplasm; from torsion of the splenic vessels when the spleen is displaced, or from an inflammatory process originating within the spleen and involving the terminal branches of the splenic artery and vein (Bonne's view).

3. Total infarction of the spleen gives rise to definite enlargement of the spleen, pain and tenderness in the left hypochondrium, fever, and occasional vomiting of blood, and from these a correct diagnosis may be made.

4. The treatment, whether medical or surgical, depends on many factors, such as the condition of the patient and the underlying disease of which the splenic infarction may be either the chief expression or only a minor part.

G. W. HOCHREIN.

Longcope, W. T.: Acute Tuberculosis; Polycythemia with Enlarged Spleen: Vaquez's Disease. *Med. Clin. N. Am.*, 1917, 1, 405.

The case which was presented by Longcope was that of a man fifty-five years of age whose chief symptoms were that of hemiplegia. On careful examination it was found that everywhere the skin was dark in color, assuming a purplish-blue; this was particularly marked about the face, neck, ears, hands and feet. There was associated with the above symptoms a dilatation of the deep and superficial veins. There was also evidence of circulatory disturbance as evidenced by clubbing of the fingers and toes and enlargement of the heart. The spleen also was found markedly enlarged.

The blood examination was as follows: hemoglobin, 130 per cent; red cells, 8,000,000; leucocytes, 12,000; with 50 per cent polymorphonuclears.

It has been supposed that the condition had its origin primarily in the spleen, but whether the

enlargement is primary or secondary or represents an accompanying condition cannot at the present time be determined. It seems probable from the work of Sampson that erythrocytes stored especially in the liver are suddenly expelled into the circulation.

There is no evidence that the polycythemia is in any way dependent upon lack of oxygen and the carrying capacity of the red cells. Butterfield has found the oxygen-carrying capacity of the blood normal in Vaquez's disease.

The morbid anatomy of the fatal cases has shown quite regularly a marked hyperplasia of the bone-marrow and an enlarged spleen, which in a few cases has been the seat of tuberculosis.

The therapeutic measures which have been tried in these cases have proved more or less unsatisfactory. X-ray, extirpation of the spleen, and bleeding are the measures employed for its relief. Bleeding seems to have been of some benefit.

M. A. BERNSTEIN.

Fiolle, J.: War Wounds of the Spleen (Les plaies de guerre de la rate). *Res. de chir.*, Par., 1917, III, 679.

Fiolle says that in the early stages of the war surgical treatment of wounds of the spleen was discouraging and led to the erroneous idea that little was to be gained from surgical intervention. Fiolle's present extensive summary of war surgery of the spleen is based on cases both personal and collected from the literature.

The size of the projectile injuring the spleen is of capital importance. The organ is friable and gorged with blood; small projectiles may tunnel through it without causing any very serious damage; but if the projectile is large, the organ ruptures. In addition to direct wounds there are cases of rupture caused by projectiles which do not directly injure the spleen. Such may be due to violent muscular contraction or other disorganization produced by a large projectile striking in the vicinity of the spleen.

Splenic injuries may therefore be divided into: (a) superficial furrows; (b) punctiform wounds; (c) tunnel wounds without rupture; (d) rupture wounds which may divide the spleen into two or more parts; (e) tears of the pedicle.

Splenic tissue has a marked tendency to infection which is frequently fatal.

The pleura is the organ most frequently concomitantly injured with the spleen. In isolated splenic wounds there is no immediate symptom. The most usual symptoms are those of peritonitis, and the symptoms which correspond to an internal hemorrhage are frequently absent. It is difficult to explain why such large effusions of blood do not give clinical signs, but such is the fact.

In splenic wounds complicated with thoracic or abdominal wounds it is even more difficult to find any symptoms referring to the spleen alone.

Although some rare cases attest that splenic wounds may cure spontaneously, yet if left untreated they nearly always prove fatal either from late hemorrhage or infection.

The peritonitis due to isolated splenic wounds is mostly localized. Generalized peritonitis is rare, but subphrenic abscesses are frequent. The progress of such abscesses is particularly rapid and malignant. They may open into the thorax and give rise to purulent pleuritis.

In diagnosis the author relies mostly on radioscopic examination which gives the most definite indications and may show a projectile in the spleen. Surgical exploration is the only certain method of establishing a diagnosis.

War wounds of the spleen have long been considered fatal. In a total of 61 splenic war wounds gathered by Fiole from 1913 to 1917 there have been 16 recoveries and 45 deaths, a mortality of 73.7 per cent. But the most recent statistics show an improvement. DePage reported 3 recoveries in 4 isolated spleen wounds operated upon. More recently still Duval and others reported 62.5 per cent of recoveries in 8 associated splenic wounds.

The great improvement in the prognosis of splenic wounds, both isolated and associated, since the beginning of the war has resulted particularly from better surgical conditions.

As a principle every splenic wound calls for immediate surgical intervention. The only definite contra-indication is extreme gravity of the general state, but only when such is due to gross lesions of the neighboring viscera. The splenic lesion then ranks second, and no intervention can save the patient. There may be cases where a splenic wound may continue for days without showing symptoms, but there will be sooner or later a fatal issue from infection or hemorrhage, and hence in all such cases when a splenic lesion is suspected or known Fiole thinks intervention should be made.

The various routes of approach are discussed; the incision will depend on the circumstances. Fiole prefers the posterior or dorsolumbar incision owing to the facility it gives for splenectomy. He describes his technique. When the spleen on exploration is found injured, splenectomy is the best treatment. It obviates septic complications and late hemorrhages. In the author's surgical automobile service 7 splenectomies have given 5 recoveries.

The author gives short histories of 44 cases of his own and some gathered from the literature.

W. A. BRENNAN.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Lewis, D.: *Myositis Ossificans Developing in a Clean Incised Abdominal Wound.* *Surg. Clin. Chicago*, 1917, 1, 1119.

Lewis presents a case in which a gastro-enterostomy was performed for duodenal ulcer. Three weeks after the operation a hard mass corresponding to the abdominal incision developed. This mass presented a bony hardness and was tender to pressure. The mass was not intra-abdominal, and showed a large shadow with the X-ray. It was concluded that the mass was a myositis ossificans of the abdominal wall.

Numerous cases have been reported in which circumscribed myositis developed in different muscles of the body. The condition usually follows one severe injury caused by blunt force in which there results considerable laceration of muscle fiber associated with hematoma. The peculiarity of this case was that it occurred in a cleanly incised wound.

No attempt was made to remove this bony mass. Lewis was of the opinion that it would be absorbed. In some instances the ossifying process develops rapidly, followed by a gradual absorption.

Etiologically circumscribed ossifying myositis may be divided into the traumatic and non-traumatic, and into those associated with defects of or diseases of the central nerve system, such as spina bifida, tabes, syringomyelia, transverse myelitis and parietic dementia.

M. A. BERNSTEIN.

Roberts, P. W.: *Syphilitic Joint Disease Simulating Tuberculosis.* *J. Am. M. Ass.*, 1918, lxx, 372.

Roberts discusses the similarity of syphilitic joint disease to tuberculosis and points out the difficulties of differentiating between the two lesions. Until recently the diagnosis of tuberculous joint disease was considered one of the simplest and most definite problems with which the orthopedic surgeon has to deal, but the more recent studies of congenital syphilis proves that this simplicity is only apparent.

In the present state of its development the Wassermann reaction is not always to be relied upon as a means of diagnosis. It frequently happens that this reaction is negative even in the presence of a direct family history of syphilis. Roberts points out that it is necessary to inquire carefully into the early life of the patient from the time of birth onward, noting the physical and mental development of the child during infancy, searching for a history of skin disease and making sure that the eruption that is called measles is not a syphilitic rash. One should examine for unduly tender tibiae, sternoclavicular joints and sterni and inquire for supposed attacks of "rheumatism," growing pains and articular disease of any sort.

One should also examine the teeth carefully. It is now recognized that inherited syphilis may be responsible for many anomalies of the teeth and that notched upper central incisors are but one of many of its curious manifestations. Perhaps the most frequent anomalies suggestive of inherited syphilis are widely spaced incisors, and irregularities

on the lingual surface of the upper molars. Roberts reports ten cases in which the dental findings were the only clues to the etiology of the joint lesions. These cases were put on antisyphilitic treatment and the lesion disappeared.

He states the results of the treatment vary according to the type of tissue invaded, the virulence of the organism and the resistance of the patient. Where there is no bone involvement, joint symptoms of long standing usually disappear in a few weeks and sometimes with astonishing rapidity. Bone lesions, however, clear up slowly, even when accompanying acute symptoms cease early; and when regeneration does take place, approximately a year of continuous treatment is necessary.

G. W. HOCHREIN.

Holland, C. T.: Two Cases of Rare Deformity of Feet and Hands. *Arch. Radiol. & Electrotherap.*, 1918, xii, 234.

The author states that he has been on the lookout for many years for abnormalities of development of the hand and foot, with special reference to the carpus and tarsus, but has practically met with none. Then, within one month, he met with two of the rarest abnormalities of these regions. In searching the literature as well as possible at the present time, he finds little on the subject. Dwight reports only two cases of the fusion of semilunar and cuneiform bones in the carpus of a negress and of a white male, and also the fusion of the external cuneiform and third metatarsal bone.

In the author's first case, a male, thirty-three years old, he states that with the exception of one-half inch shortening, the foot appeared normal in all respects. Points noted were:

1. The cuboid was completely fused with the base of the fourth metatarsal. There was no line of demarcation, and the shape of the joint formed by the base of the fifth metatarsal was more oblique than is normal.

2. The external cuneiform was completely fused to the base of the third metatarsal.

3. There was only an indication of a joint between the middle cuneiform and the base of the second metatarsal.

4. The scaphoid was completely fused with the internal cuneiform.

5. The joint between the internal cuneiform and the base of the first metatarsal was poorly formed.

A radiograph of the other foot showed nothing abnormal.

The second case was a woman twenty-one years old. Points noted were:

1. The os calcis and cuboid were completely fused without any indication of the junction.

2. The external cuneiform was fused partially with the base of the third metatarsal, but a line of demarcation was shown.

3. The middle cuneiform was completely fused with the base of the second metatarsal.

4. The astragalus was completely fused with

the scaphoid, but showed in the upper part an indication of demarcation.

In this case the apparently normal hands showed:

1. Fusion of the unciform and cuneiform bones.

2. Fusion of the os magnum and trapezoid bones, complete on the left side, incomplete on the right side.

3. The semilunar was between the os magnum and unciform and articulated equally with each.

4. The scaphoid was abnormally shaped in each hand.

5. Each little finger showed a short middle phalanx.

C. B. HOLLINGS.

Gottlieb, I.: The Role of Minor Surgical Procedures in the Development of Thrombo-Angiitis Obliterans. *N. Y. M. J.*, 1918, cvii, 65.

The object of this paper is to call attention to the dangers in the injudicious use of the knife for treating such minor complaints of the foot as an ingrown toe-nail, hammer-toe, bunions, corns, callosities, varicosities, swellings and abscesses of the foot or toes.

Because of the pendent and distant position of the toes and of their limited mobility, the circulation in them is naturally poorer than anywhere else in the body and therefore wounds of those parts heal with greater difficulty than any other wounds, even in normal individuals.

Those patients with thrombo-angiitis obliterans suffer from the effects of a weak circulation in the feet for a long time before the frank development of the disease, as evidenced by cold, excessive paleness, pains and cramps, intermittent claudication, occasional swelling of the feet, poor healing properties of tissues, etc. When, however, trauma to the tissues and blood-vessels is produced by the surgeon, the circulation is so much disturbed that the resulting wound refuses to heal, an ulcer is produced which is exquisitely painful, or a slowly acting infection sets in with the exposure of nerve terminals, excruciating pain and all the symptoms of thrombo-angiitis obliterans.

The following history is fairly typical and illustrates the point under consideration. The patient, thirty-seven years old, a Russian Hebrew, gave a negative family and personal history. He was a heavy cigarette smoker. About 18 months previous, he began to be troubled with coldness and slight pain in the right leg and foot, but was not inconvenienced till about four months before he was seen, when the little toe became red and swollen. A doctor, thinking that there was infection, cut into the toe and a wound resulted which refused to heal and became very painful, the patient was in agony day and night. The ulcer showed no tendency to heal. Pulsations in the foot were not palpable.

This history is fairly typical and illustrates the importance of obtaining a history and making a thorough physical examination when a patient presents himself with what might seem to be a trivial affection.

The following points in the history are suggestive of the disease:

Pain in the feet and legs not relieved by any orthopedic measures; cramp-like sensations in the calf of the leg when walking; forcing the patient to stop frequently; a tingling sensation in the toes; a burning sensation in the toes; one foot colder than the other; a history of frost-bite and of migrating phlebitis.

The following signs are indicative of the disease: a red or dusky red color of the toes or an excessively pale appearance of the foot; a rapid blanching when slightly elevated; an absence of pulsations in the dorsalis pedis or plantar arteries of the foot. When the pulsations in one foot are not perceptible or are weaker than in the other, arterial obliteration should be suspected and one should be highly conservative in the treatment of any complaint of the foot for which the patient may present himself.

Any surgical interference is contra-indicated because of the certain harm done to the circulation by the trauma to the tissues and blood-vessels, but instead, measures should be taken to improve the circulatory condition of the limbs by the various means at command.

The following conclusions are drawn:

1. Thrombo-angitis obliterans is, as a rule, insidious in its development and many suffer from it for years without developing gangrene or the extremely painful characteristic ulcerations.

2. The symptoms and signs of the disease are very often mistaken for some other minor surgical affection, and surgical treatment is resorted to in order to relieve the patient.

3. The trauma to the tissues and the blood-vessels still more interferes with the nutrition of the parts; ulcers are produced which are extremely painful and do not heal rapidly, and often gangrene supervenes.

4. In any complaint of the foot, one should always bear in mind the possibility of this disease, and the physician should go thoroughly into the history of the patient and ascertain carefully the circulatory condition of the foot.

FRACTURES AND DISLOCATIONS

Buckner, H. T.: Treatment of Compound Fractures of the Forearm. *Ann. Surg. Phila.*, 1918, LVII, 179.

The author's apparatus is also suitable for compound fractures in and about the elbow-joint. It consists of two parts: a metal cuff well padded and strapped around the humerus, and a metal frame that holds the forearm. The frame is made longer than the forearm in order that extension straps can be fastened to the forearm, and to the straps is fastened some rubber, that is, fastened to the cross-bar of the frame; thus permitting extension to be made upon the forearm if desired. A piece of cotton flannel or muslin can be folded over the longitudinal bars and pinned, making a soft

hammock for the arm to rest in. If necessary for firmer support, a well-padded splint can be put in the hammock beneath the forearm.

The frame is made adjustable, allowing elbow motion or fixation in flexion; it is open, so the wound can be reached for purposes of medication. By turning over the cuff that fits around the humerus and by turning over the cross-bars, the apparatus can be used on the opposite arm. The splint is light and can be made of either aluminum or iron; it is an ambulatory splint, and the patient can be up and around without retarding his recovery.

P. G. SKILLERS, JR.

Vincent, W. G.: Greenstick Fractures of the Forearm; Correction of the Deformity by Continuous Elastic Traction. *J. Am. M. Ass.*, 1918, LXX, 78.

The treatment of greenstick fracture of the forearm by continuous elastic traction suggested itself to the author at a meeting of the New York Surgical Society, when Taylor described an elastic traction method of treating Volkmann's ischemic contracture. Several months later the author applied this method to fractures of the forearm in children.

The case which he described was that of a child who fell three weeks previously and injured the left forearm. On examination a greenstick fracture of both bones was disclosed. There was considerable bowing. The callus was still soft so the arm could be partially straightened. This deformity returned as soon as the corrective force ceased.

Elastic traction was then employed, which consisted of the following: A padded wooden splint reaching from the elbow to the palm was applied to the anterior surface of the forearm and held in position by adhesive plaster straps. A fairly thick gauze pad, about one and one-half inches square and enclosing a bit of splint wood, was placed over the most prominent point on the back of the forearm, and a rubber band one-eighth or three-sixteenths of an inch wide was slipped over the hand and arm so that it encircled the arm at the center of the gauze pad, and was held in position by a strip of adhesive plaster. The rubber band was under moderate tension, and caused no interference with the circulation below that point. A gauze bandage was applied so as to be snug but not compressive from the palm to the elbow.

At the end of a week the bowing was found to have markedly decreased; but as the elastic band had been allowed to touch the skin at each border of the arm, the skin had been partially cut through at each of these points.

It is advisable to make the splint on the concave surface somewhat wider than the arm, and to pass a broad strip of adhesive plaster rather loosely around the arm over the splint and the gauze pad which has been placed at the point of greatest convexity. The rubber band is then adjusted over this and held in position by short, vertically placed adhesive strips anteriorly and posteriorly.

The author has since applied this method in six cases with very satisfactory results. He claims an earlier convalescence and freedom from pain.

M. A. BERNSTEIN.

Lewis, D.: Separation of the Lower Epiphysis of the Femur with Anterior Displacement and T-Fractures. *Surg. Clin. Chicago*, 1917, I, 1105.

Lewis states that traumatic separation of the lower epiphysis of the femur is usually due to hyperflexion or hyperextension of the knee-joint, and is probably most frequently caused by torsion of the leg when the latter is extended. Montgomery recently reviewed the literature and reports 27 cases, including two cases of Lewis'.

It is interesting to note that in 18 cases the injury was caused by the leg being caught in a revolving wheel or in machinery. In 7 cases it was caused by direct violence. The youngest case reported was eighteen months, the oldest twenty years.

Open reduction is the method of choice. The author believes that acute flexion may be tried, but in his cases the fragments could not be reduced nor retained after reduction until the fracture was exposed. The epiphysis could be easily reduced after the knee was flexed, when direction manipulation could be combined with acute flexion. Even after fixation with a Lane plate it seemed to be advisable to maintain some degree of flexion at the knee-joint, for there was a tendency for the fragment to be displaced somewhat when extension was attempted.

Of striking interest are the methods that have been used in the treatment of this condition. Amputation has been resorted to in 14 out of 27 cases. This was deemed advisable on account of the amount of damage to the knee-joint during the injury. Resection of the knee was resorted to in cases where a proper alignment of the fractured ends could not be obtained by the open operation. Lewis believes that resection should be limited, first to those cases in which the fragments cannot be brought into alignment by open operation, and when the deformity and disability resulting from failure to reduce the displacement would be greater than that resulting from shortening of the extremity. Secondly, the operation should also be limited to those cases in which the structures entering into the formation of the knee-joint are so badly damaged that the results following reduction of the displacement would be nil.

The first case which Lewis presents was a girl who sustained a separation of the lower epiphysis by catching her heel in a revolving wheel of a bicycle. Several attempts were made to reduce the deformity with a resulting rotation of the lower fragment and flexion of thirty degrees. At a second operation the lower fragment was reduced and rotated. It was retained in position by a Lane plate. The patient made a recovery with one and one-half inches of shortening. Lewis believes that

shortening will increase, since the epiphysis has an influence on the growth of the leg.

The second case was that of a young man who, half an hour prior to his admission, was injured while riding a motorcycle. A T-fracture of the lower end of the femur was found. The lower end of the shaft was displaced inferiorly, and the condyles fairly widely separated by the line of fracture, and displaced backward. No open operation was performed for a few days on account of an extreme abrasion. During this time traction was carried out. The operation which was performed later was done for a final correction of the deformity. This consisted in the introduction of a nail transversely through the condyles. The shaft was maintained in place by a Lane plate. The nail may have to be removed at some future time, Lewis states, because they often work out to the skin.

In commenting on the introduction of nails into joint surfaces the author quotes Mann who says that nails and screws are tolerated in joint surfaces in the human as well as in experimental cases on animals with surprisingly little reaction.

M. A. BERNSTEIN.

Lane, W. A.: The Treatment of Fractures in Warfare. *Lancet*, Lond., 1918, cxciv, 4.

The author in this well illustrated article remarks that no surgical cases during the war have been so badly treated as simple fractures. This was due either to a lack of knowledge of the mechanics of fractures or imperfect technique. Lack of asepsis, improper strength of plates and screws, screws torn out because the gauge of drill and screws did not correspond, and the splinting of bone fragments in poor position are some of the causes leading to such poor results.

He concludes as follows:

1. Only exceptionally should fragments be fixed by plates when the wounds are very foul.
2. If found necessary under such circumstances, the screws should be inserted as far as possible away from the seat of the fracture.
3. Operative interference should be postponed until the wounds have healed, and consequently the tissues are free of organisms.
4. If a septic focus is noted during operation, a culture and vaccine should be obtained for use should infection ensue.
5. Should there be a suspicion of the presence of latent sepsis, the Carrel method of irrigation should be employed. Otherwise the wound should be completely closed.
6. Under no consideration should any bone be removed. Accurate apposition can be obtained if the surgeon knows how to bring it about.
7. Fragments of bone and callus should be saved to fill in any interval in the shaft.
8. Much heavier steel plates are needed in the malunited fractures produced by projectiles than are usually employed in less comminuted fractures in civil life.

9. Provided no strain shall be exerted on the junction, the sooner a patient with fracture of the long bones of the leg is got up and about, the more bone will be deposited. For this a good ambulatory splint is necessary.

10. If the interval between the fragments precludes union, a bone graft must be inserted.

11. Rarefying osteitis around screws and plates is evidence of faulty technique.

12. More skill is required for this work than any other war time operative procedure.

13. Sepsis and hemorrhage are the two greatest risks.

C. B. HOLLINGS

SURGERY OF THE BONES, JOINTS, ETC.

Shepherd, W. M.: Gunshot Injuries of the Elbow-Joint; Treatment by Early Excision. *Brit. M. J.*, 1918, 1, 149.

Injuries inflicted in the region of the elbow-joint of necessity vary with the nature of the missile, the degree of sepsis, and the amount of damage to bone and soft parts. The ultimate results of injuries to the elbow-joint by gunshot cannot be regarded as satisfactory, as in the majority of cases there is complete ankylosis. Even if the wound remains aseptic, bony out-growth will in the long run inhibit movement to a considerable degree.

When the bones entering into the formation of the elbow-joint are badly comminuted, sepsis spreads in the surrounding parts and the patient shows signs of septic absorption. Whatever method of combating infection is undertaken, the results are the same, affording risk to both life and limb.

Primary excision of the elbow for tuberculous disease, fracture, dislocation, etc., yields good results and it would appear feasible that equally good results might be obtained by early excision of wounded joints. The degree of sepsis in the surrounding tissues forms no contra-indication to immediate excision. The amount of bone to be removed depends upon the nature of the primary injury.

In an early series in which the humerus was removed just above the epicondyle with the whole head of the radius and ulna, movement was long in returning. In a later series the lower end of the humerus was removed above the epicondyles and rounded well off, preserving the radius and ulna intact and not interfering with the attachment of the triceps to the ulna through the angled incision of Kocher.

If the amount of sepsis was great the wound was left open and treated with eusol gauze or the Carrel-Dakin method, the arm splinted at right angles until sepsis subsided. In milder cases the wound was partially closed.

The splint is left off as soon as the wound has healed and motion is encouraged.

The results, even in septic cases, were surprising, the patient being out of bed early and movement encouraged by the end of the fifteenth to the eighteenth day. The author states that the earlier

the excision is performed, the more certain is the patient to have a good and serviceable arm with free movement.

V. C. HEST

Cumston, C. G.: The Treatment of Wounds of the Knee-Joint from Projectiles in Warfare. *Ann. Surg.*, Phila., 1918, LVII, 170.

The anatomical varieties of wounds of the knee are many, but may be roughly classified as follows: (1) Seton or tunnel wounds without fracture, the bullet passing directly through the joint or remaining free within. This event is not common. (2) Wounds with fracture of one of the bones composing the joint, such as crushing of the tibial plateau, crushing or comminuted fracture of the patella or the femur, one or both condyles broken off or crushed. (3) Wounds resulting in fracture of both tibia and femur, usually accompanied by fissures extending into the knee-joint. (4) Wounds with crushing of the articular surfaces, frequently with extensive destruction of the surrounding soft structures.

Some surgeons are prone to amputate with far too great a readiness in wounds of the knee, particularly when there is fracture. This practice is bad and should be condemned.

Amputation is absolutely and unquestionably indicated: (1) when there is crushing of the knee-joint or when the surrounding soft structures and bones forming the joint are so destroyed that they cannot be saved; (2) when there is a wound of the knee with injury to the large vessels in the popliteal space, but ligature may first be done if this is possible and an attempt made to preserve the limb, although generally the result will be unsuccessful; (3) immediate amputation must be done when there is gangrene of the leg or when a purulent arthritis is complicated by secondary hemorrhage from the popliteal artery, as occasionally happens.

The important principle to follow is to disinfect the wound and then obtain thorough drainage and immobilization of the joint. Never suture the wound after resection; leave it open without a single stitch being taken.

Penetrating wounds of the knee-joint by projectiles without lesions of the articular ends of the bones, the projectile having made its exit from the joint cavity, have been relatively frequent, although they are seldom met with in any other joint. When seen early, the knee is swollen.

When there is apyrexia it is probable that the lesions to the joint are not serious, and rest in bed, compression and immobilization in a fracture gutter will soon cause the swelling to disappear. If at the end of three to four days the intra-articular fluid collection has not become absorbed, it is preferable to empty the joint. Never use an aspirating needle for this.

When there is pyrexia, arthrotomy is indicated and should be undertaken without the least delay.

The joint is irrigated once or twice daily with sterile salt solution or with some very mild anti-

septic solution, if preferred, after which it is good practice to spray the joint cavity with ether. As soon as there is apyrexia and the wound has taken on a red look irrigation is to be stopped and aseptic dry dressings applied every two or three days according to the amount of discharge; the drains are removed.

The early removal of bullets, shrapnel or shell bits from the joint is imperative. The technique of the operator is described.

Penetrating wounds of the knee with bone lesions are very serious on account of their evolution, and this fact has led many surgeons to resort to amputation at once, a practice which should be most strongly condemned. Simple arthrotomy is not enough, as many times the epiphyses may be fissured. These fissures are the factors of osteomyelitis, an important cause for amputation in injuries of the knee-joint.

The proper treatment of these cases is typical subperiosteal resection if the amount of damage done is not so considerable as to require more than the excision of 10 cm., as otherwise the resulting shortening would leave a useless limb. When the damage to the bone is too considerable, likewise that of the surrounding soft structures, with lesions of the popliteal vessels, amputation is the only recourse left to save the patient, and in order to be as economical as possible, always perform circular amputation as low down on the thigh as possible and never suture the stump.

Arthrotomy will not prevent the nefarious evolution of infection and osteomyelitis, and in cases in which this operation has given good results, the lesions were confined to the synovia and no damage done to the articular surfaces.

To derive the greatest amount of good from subperiosteal resection of the knee-joint, the time at which it is undertaken is of capital moment. If the operation is resorted to some time after the receipt of the injury, between ten and twenty days, or if the operation is done following a primary arthrotomy, which, unfortunately, is not uncommonly the case, it may be termed a late resection.

Defined as above, late resection gives very bad results and is bound to give rise to disappointment and discredit this otherwise orthopedic and life-saving operation, which should be resorted to early, during the first three or four days following the receipt of the injury. It is understood that the anatomic diagnosis has first been made by means of radiography.

EDWARD L. CORNELL

Le Fur, R.: Osteosynthesis in War Surgery [*L'ostéosynthèse en chirurgie de guerre*]. *Paris chirurg.*, 1917, ix, 283, 405.

Le Fur reports 33 personal operations of osteosynthesis in war surgery, the case histories of which are detailed and illustrated. Twelve of the cases concern the upper limb and 20 the lower limb.

Osteosynthesis is a method which appeals to the younger surgeons of the new war school rather than

the experienced men of the older types. But circumstances make the method particularly applicable to the traumatic fractures of war.

The operation is not a grave one. In Le Fur's operations, 7 on the humerus, 8 on the femur, and 10 on the tibia, at times carried out under conditions of severe infection, he has not had a single death.

Osteosynthesis has a special indication in war wounds which as a general rule are infected. In such case union is liable to fail, or if it does not, it is at the cost of enormous callus and malformation. In some cases where all the usual methods have failed to obtain consolidation, osteosynthesis has given excellent results.

The lapse of time between injury and osteosynthesis in the author's 33 cases varied from two days to thirteen months; 12 were done in a period less than two months; 5 in from two to four months, and 16 in from four to twelve months or over.

Le Fur discusses the indications for osteosynthesis in: (a) pseudarthrosis with or without large loss of substance; (b) according to the nature and progress of the fracture, whether aseptic or infected.

In the technique the principal points are: chloroform anesthesia; the frequent incision of the existing wounds or scars; the osseous extremities are often greatly displaced or united by a malformed callus or bridge of bone, sometimes there is extensive periosteitis, and instrumental removal of all pathologic tissues therefore calls for much patience and delicacy so as to free the bone ends in good condition; treatment of the bone ends and especially of the medullary canal; reduction, coaptation and fixation of the fragments.

The author disagrees with Delbet who counsels the use of plates alone in fixing the fragments and condemns metallic sutures. Le Fur thinks the latter are well supported in an infected area, while the plate is often badly tolerated. If the wire suture is placed in healthy bone, it does not ordinarily cut it.

In many cases where plating failed, Le Fur has found the wire suture gave good results. He has used plates in 19 cases and silver or bronze wire in 13. In the upper limb suture was done in 9 cases successfully, and plating unsuccessfully 4 times. In the lower limb both plating and suture have equally given good results, though plating gave a slower consolidation.

Le Fur gives details of the technique both for suture and plating.

After operation the limb is immobilized in plaster. With regard to removal of the plates, Delbet thinks they should be allowed to remain from four to six weeks. Le Fur, however, thinks that from three to four weeks' stay suffices, especially if there is infection. If the limb is well immobilized nothing is to be feared. Sutures are better tolerated. In some cases they have been left three months or even indefinitely. The postoperative treatment consists of mechanotherapy, physiotherapy and heliotherapy.

The final results obtained by Le Fur are as fol-

lows: in the upper limb 11 cases have given 9 successes and 4 failures, including 3 cases of pseudarthrosis. In the lower limb 20 osteosyntheses gave 18 successes, 4 of them with delayed consolidation, 1 partial failure, and 1 total failure. In the latter case a bone graft was used.

By "success" the author means a completely consolidated bone with recovery of function of the limb. In the upper limb osteosynthesis with suture has given good union in every case where this was delayed because of muscular interposition or definite pseudarthrosis.

W. A. BRENNAN.

Delagenière, H.: Cartilage Graft After Resection for Bony Ankylosis (De la greffe cartilagineuse pour assurer un bon fonctionnement articulaire après résection pour ankylose osseuse). *Bull. et mém. Soc. de chir. de Par.*, 1917, xlii, 2195.

Delagenière relates the details of two cases of bony ankylosis of the elbow after gunshot wounds, in which resection was done. A piece of costal cartilage was removed from the left side and shavings of it placed between the sectional bone surfaces so that all empty spaces were filled.

After operation passive motion was begun with the greatest care. The final results of the operation were excellent, flexion and extension being complete. Radiographs showing the results accompany the article.

W. A. BRENNAN.

Leriche, R.: Results of Extensive Primary Subperiosteal Removal of Bone Splinters (Résultats de l'escarification sous-périostée large primitive). *Bull. et mém. Soc. de chir. de Par.*, 1917, xlii, 2270.

For a long time Leriche has advocated extensive primary subperiosteal removal of bone splinters as the only method of assuring the favorable outcome of war fractures. His views have met with much opposition, since such a course was believed to favor pseudarthrosis.

In the present report Leriche gives the results in a series of 20 diaphyseal fractures treated according to this method, from the seventh to the eighteenth hour after injury. The cases include 5 femur fractures, 5 leg fractures, 4 humerus fractures and 6 fractures of the radius or cubital bone.

Consolidation has been effected from the twenty-fifth to the fortieth day. The majority of the radiographs show an enormous callus mostly fusiform. The reason for the differences between Leriche's results and those obtained by others who condemn his method is that total or substantial removal of bone splinters has been done, complemented sometimes by fragmental diaphyseal resections, a method which Leriche has always disapproved. He has always done a wide subperiosteal removal of such bone fragments as prevent access to the medullary canal. Another reason is the difference of opinion as to what constitutes periosteum. Many of those differing from Leriche consider the periosteum as a membrane of two layers, one hard and thick, the other fragile and adherent to the bone.

from which it is difficult to detach it. Leriche considers the periosteum as representing the fertile part of the bone, the part utilisable for osteogenesis and not a thin layer adherent and detachable but merely the external part of the bone, representing the old embryonal cells of adolescence. If it is desired to keep the periosteum integral and fit for osteogenesis, this outer layer must not be stripped but the bone must be cut into with a special cutting file or rasp, and dealt with subperiosteally.

W. A. BRENNAN.

Delagenière, H.: Osteoperiostic Tibial Grafts for Reconstruction of Bone or Repair of Losses of Osseous Substance (Méthode générale et technique des greffes ostéopériostiques prises au tibia pour la reconstitution des os ou la réparation des pertes de substance osseuse). *Bull. et mém. Soc. de chir. de Par.*, 1917, xlii, 2288.

Delagenière removes his grafts from the internal face of the tibia. In order to obtain a good result it is necessary that the two faces of the grafts should be placed in contact with the living tissues and that no dead space should exist about them.

It is well to remove all cicatricial and sclerous tissue which might come in contact with the graft, the vitality of such tissues being much diminished.

No antiseptics hurtful to the vitality of the graft should be employed.

Good hæmostasis is essential in order to avoid hæmatomata; and the wound should be well tamponed.

Delagenière gives the technique of application of the tibial osteoperiostic grafts in (a) cranioplastics, (b) pseudarthroses of the maxillary with loss of bone substance; (c) pseudarthroses of the long bones with or without loss of bone substance; (d) stoppage of bone cavities; (e) massive facial and other grafts.

The progress is easily followed by radiography as well as clinically. It is seen that the graft becomes the point of growth of new bone which leads to union.

Delagenière has never observed an instance of resorption of the graft. When there is elimination, there is still a result, though the bone formed is less solid and thinner than otherwise.

The results of 118 recent cases were as follows: in 52 cranioplastics, 44 very good results, 7 good results and 1 failure with elimination; in 27 grafts for pseudarthrosis of the lower maxillary with loss of bone substance there were 10 very good results, 7 good results not definitely conclusive, 2 satisfactory, 3 partial, and 5 bad results.

In 21 grafts for pseudarthrosis and loss of substance of the long bones there were 13 good results, 5 partial and 1 negative result with elimination. There was 1 death from chronic septicæmia. Three fillings of bone cavities have resulted successfully. Sixteen grafts for massive facial defects have given 14 good and 2 incomplete results. One graft for the radical cure of hernia has been followed by a very good result.

W. A. BRENNAN.

ORTHOPEDICS IN GENERAL

Gillette, A. J., and Chatterton, C. C.: *The Orthopedic Treatment of Deformities Resulting from Incurable Paralysis*. *Minnesota Med.*, 1918, 1, 1.

This article deals with various forms of paralysis which are often confused with anterior poliomyelitis. Progressive muscular paralysis is discussed in a broad general way and the suggestion is made that these cases are "greatly benefited for years, but never cured, by applying braces and supports."

Hereditary ataxia or Friedreich's disease, caused by sclerosis of the posterior and lateral columns of the cord, and frequently accompanied by distortion of the feet, legs or back, is often benefited by braces.

Cerebral paralysis of childhood (spastic paralysis) is very frequently confused with anterior poliomyelitis; cerebral paralysis is always a spastic paralysis with increased reflex and usually affects the mentality, while acute poliomyelitis is always a flaccid paralysis with diminished or absent reflexes and does not affect the mentality in any way.

In treating spastic paralysis, the deformity must be overcome by tenotomies before braces are applied.

Pseudo-rachitic paralysis is frequently confused with anterior poliomyelitis. The one symptom which is always present in pseudo-rachitic paralysis is that the reflexes are practically normal and the child can, with some effort, move its extremities.

Scurvitic children have been mistaken for anterior poliomyelitics, in the early painful stage. The normal reflexes, lack of atrophy and the spongy gums will differentiate. Volkmann's ischæmic paralysis, Erb's paralysis and Charcot's joints are sometimes mistaken for anterior poliomyelitis. The localization, history and course of the disease will usually be sufficient evidence to make a differentiation.

Charcot's joints are best treated by braces since excision is out of the question, for the bones will not unite, and amputation is useless as the inability to locomote is due to disease of the spinal cord.

R. B. COFIELD.

Gosman, G. H. R.: *Brief Studies in Flat-Foot*. *Mil. Surgeon*, 1918, viii, 36.

The author believes:

1. That subjectively symptomless flat-foot, in civil life, quickly becomes a source of trouble and invariably gives acute symptoms under the burden of intensive training.

2. That any given case objectively showing a flat arch, even though of the first degree, should be rejected for enlistment, unless all motions of the toes and ankles are free to the extreme degree.

3. That their system of recording, i. e., making imprints by applying ordinary finger print ink to the sole, after which the foot is placed upon paper lying on the floor and the man directed to stand squarely upon it, indicates by comparison the degree of improvement in motility under muscular exercise properly conducted.

4. That their method employed since August, 1917, in the treatment of flat-foot is the plan best adapted to the needs of men in the army undergoing intensive military training.

5. That the non-resistant exercise plan is most effective and shows results well calculated to make its adoption in military practice advisable.

The treatment recommended is as follows: The toe exercises are the first ones taken up. The men stand on a raised platform like a two-inch plank; they are then directed to flex the toes to the extreme point of flexion with a hard pull of the flexors of the sole of the foot at the extreme point of flexion. This is followed by extension without effort. This exercise is repeated continuously for from five to ten minutes.

The second exercise is a continuation of this flexion of the toes on the sole of the foot, bringing into action the tibialis anticus muscle. At the extreme point of inversion or adduction, a strong hard pull is made, then the foot is allowed without any muscular effort to resume its usual position.

At the beginning fifteen or twenty minutes are sufficient for the entire routine of exercise, later a full half hour.

PHILIP LEWIN.

SURGERY OF THE SPINAL COLUMN AND CORD

Silva, R. H.: *Two Cases of Spondylosis* (Deux cas de spondylose). *J. de radiol.*, Par., 1917, ii, 673.

In the first case presented by the author the cervical region showed ossification of the prevertebral ligament, especially about the fourth, fifth and sixth cervical vertebrae. There was no osseous rarefaction. In the dorsal region there was bony union of the meniscus of the first vertebra with osseous density, the lesions predominating in the anterior part of the vertebrae. The shoulder joints were normal. The hip joints showed deformity with ankylosis. The scapula showed enlargement of the transverse diameter. There was intense calcification of the tracheobronchial ganglia.

In the second case the cervical region showed ossification of the prevertebral ligament, which was quite rigid; osseous density about the spinous processes and ossification of their ligaments; deformity of the glenoid cavities; calcification of the tracheobronchial ganglia; the humeral head was normal in appearance.

It is known that spondylosis, first described by Marie in 1898 and afterward studied by Leri, is a disease characterized essentially from the clinical viewpoint by a more or less complete ankylosis of the vertebral column and the shoulder and hip-joints. It has been ascribed to syphilis, tuberculosis, or myositis ossificans. The author thinks that the

marked tracheobronchial adenopathy which completely obscured the pulmonary hilum in both of these cases indicates an infection either tuberculous or gonorrhoeal.

W. A. BRENNAN.

Bertolotti: Contribution to the Study of Defects in Differentiation of the Vertebrae, Especially of the Fifth Lumbar (Contribution à l'étude des défauts de différenciation des vertèbres, et particulièrement au niveau de la cinquième lombaire). *J. de radiol.*, Par., 1917, II, 673.

By defects in the differentiation of the vertebrae is understood the fact that a given vertebra, cervical, dorsal or lumbar, does not show those characteristics which differentiate it from vertebrae belonging to other spinal segments, and that it may even show monstrosities of phylogenetic order. Abnormal vertebrae may acquire the characters of the metameres situated above or below them. Thus the seventh cervical sometimes shows the character of a dorsal vertebra and the anomaly of a cervical rib. Such anomalies may pass without recognition, but in certain cases they become a source of great trouble and danger. An atlas defect, for example, characterized by the fusion of its lateral masses

with the occipital condyles or by an incomplete ossification of the posterior or anterior area, may give rise to serious consequences.

The fifth lumbar vertebra normally may acquire the characteristics of a sacral vertebra. This relatively frequent accident has the marks of a real pathological entity which appears in individuals towards the end of their growth period without in any way previously suggesting its presence. Lumbar neuralgic pains radiating into the lower limbs, with all the characteristics of rebellious sciatica, atrophy, and sometimes considerable impotence, constitute these symptoms.

Radiography shows an abnormal unilateral or bilateral development of the fifth lumbar vertebra which has more or less intimate relations with the sacrum. Examination shows the lumbar region shortened, the back flat, the bi-iliac diameter increased; there is some dorsolumbar kyphosis and lumbosacral angular scoliosis. The diagnosis must be differentiated from vertebral tuberculosis and urinary calculi. The author affirms that in the large majority of cases the so-called essential sciatic neuralgias are caused by vicious formations of the sacrolumbar region.

W. A. BRENNAN.

SURGERY OF THE NERVOUS SYSTEM

Williamson, R. T.: The Vibrating Sensation in the Differential Diagnosis of Affections of the Spinal Cord and Peripheral Nerves. *Lancet*, Lond., 1918, CCXIV, 216.

Williamson calls attention to the value of the vibrating sensation in the differential diagnosis of affections of the spinal cord and peripheral nerves from hysteria, functional diseases and malingering.

He tests the vibrating sensation by a large vibrating tuning-fork, the foot of which is placed on a subcutaneous bony surface, such as the malleoli, the inner surface of the tibia in the leg, the anterior superior iliac spine, the styloid process of the ulna at the wrist, the sternum, etc.

Loss of vibrating sensation is often one of the earliest signs of sensory affection in lesions of the spinal cord. It is often lost before other forms of sensation are affected.

In the differential diagnosis of organic paraplegia from hysteria, functional disease, and malingering, he calls attention to the following point. In any case of paralysis or paresis of the legs, if the vibrating sensation is lost, while other forms of sensation are recognized, and the patient persists in this statement in spite of suggestions to the contrary, malingering or hysteria is very improbable. In malingering or hysteria, if sensation is affected, the vibrating sensation and other forms of sensation will usually be lost together.

Vibrating sensation has been lost in cases of spinal disease which have come under the author's observation that were probably due to combined

pos erolateral degeneration and lost at a very early stage before other forms of sensation had been lost. He quotes the case of a man called for military service in 1917. The patient stated that he considered himself unfitted for military service because of a weakness or heaviness in his legs and slight unsteadiness in walking. Little could be detected on examination. On the next examination no signs of cerebral disease or tabs could be detected, and the slight unsteadiness in walking could have been attributed to neurasthenia or malingering but for two signs. The knee-jerks were normal; no ankle clonus could be obtained; and the only definite sign of organic disease was the loss of the vibrating sensation on the legs and the change in the plantar reflex. Six months later he showed well-marked signs of organic disease.

Williamson calls attention to the value of testing the vibrating sensation in the numerous cases of lesions of the cord and peripheral nerves now coming under observation in military practice.

G. W. HOCHREIN.

Langley, J. N.: The Effect of Intermittent Stretching on Muscles and Nerves After Nerve Severance. *Brit. M. J.*, 1918, I, 141.

One of the problems of the treatment of cases of nerve severance is the time during which movement of the paralyzed muscles can be allowed and the extent to which it can be carried on with safety. In the period before suture the practice is to allow some degree of movement, while for a time after suture

no movement at all is allowed, for, as Sir Robert Jones says, "the slightest stretching of a muscle on the point of recovery disables it again;" also prolonged stretching of a muscle causes prolongation.

The effect of intermittent stretching might be advantageous or the reverse, according to the weight which is laid on particular events. On the one hand it forces lymph from the muscles, and so presumably metabolic products, and this one would expect to be advantageous. In denervated muscles connective tissue increases and part of the late contracture is attributed to the shrinking of the newly formed tissue. The connective tissue when first formed is soft and extensible, and intermittent extension will elongate the developing fibers, so that when they shrink there may be less tendency to contracture. On the other hand, muscles after denervation rapidly lose weight and in this state cannot stand as great a strain as normally.

In an experiment on an animal it was shown that stretching the paralyzed muscle a great number of times to about the full normal extent did not appreciably affect the atrophy. The author has made observation on muscles in later stages of atrophy up to about three months and has seen no sign that they are injured by moderate intermittent tension, or by the degree of strain exercised by antagonistic muscles, provided this is not prolonged.

The author concludes from his observations that, in the pre-suture period, fairly free extension and flexion movements are not likely to injure either

muscle or nerve, but forcible movements are always to be avoided.

As regards stretching of a nerve by movement after nerve suture, where the nerve is not shortened, restricted movements can be made without injury. In experiments on animals it is shown that a considerable degree of movement does not prevent rapid regeneration in an unshortened nerve. In man, the author concludes, when the nerve is not shortened, slight movements can be begun in a few weeks and rapidly increased in extent.

In the great majority of cases in man the nerve has to be shortened, and until the ends become firmly joined a very slight movement may be sufficient to rupture the fibers at the junction and cause a more or less serious delay in regeneration. The greater the shortening of the nerve, the greater the risk. It would probably be better to insert a piece of fresh nerve when much nerve has to be excised.

It is generally recognized that if a nerve has been severed, the sooner it is sutured the better. The difficulty is in distinguishing between complete nerve compression which will recover without operation, and nerve severance which requires operation. In simple compression new fibers are formed in the part of the nerve just below the point of injury long before there is any sign of recovery on stimulating muscles and motor points. If, then, this region could be stimulated without the stimulation spreading to the normal nerve, it would give rise to sensation, and compression would be diagnosed. V. C. HUNT.

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESSSES, ETC.

Bullock, F. D., and Rohdenburg, G. L.: A Histological Study of Heterologous Tumor Grafts. *J. Cancer Research*, 1918, iii, 31.

While the death of some heteroplastic tumor grafts may, perhaps, be attributed to the action of lymphocytes and connective tissue, there is no histological proof that it is always determined by these factors. Tumors elicit in foreign species a reaction of much the same character as that produced in homologous animals. Removal of the spleen has no influence upon the receptivity of an animal toward heteroplastic tumor grafts, nor does splenectomy favor the growth of heteroplastic tumor grafts. One inoculation of a heterologous tumor does not always render an animal immune to the temporary growth of a subsequent heterologous graft.

MAX KAHN

Lumière, A.: The Laws of Cicatrization of Cutaneous Wounds (Les lois de la cicatrisation des plaies cutanées). *Rev. de chir.*, Par., 1917, liv. 636.

Lumière reviews the work of Carrel and others who studied the relation between the size of a

wound and its rate of cicatrization. Carrel found that cicatrization proceeded more rapidly at the beginning than at the end of the repair period; that cicatrization was proportionate to the surface of the wound; and that the process of contraction was the most important factor in the repair of a wound.

Such deductions have been translated into mathematical formulæ which the author gives and interprets.

The author has made a number of clinical observations and experiments in various hospitals; also experiments on dogs in an endeavor to verify the laws of cicatrization.

His findings differ from those of Carrel. For experimental, non-infected wounds, frequently dressed by the antiseptic method, in a given animal species, he deduces the following laws of cicatrization:

1. The rate of cicatrization of a wound is constant; that is to say, the wound cicatrizes as rapidly toward the end of the healing period as at the beginning.

2. The time necessary for cicatrization is proportional to the greatest diameter of the wound.

3. In healthy animals of the same age and in the same species, the rate of healing is practically the same.

W. A. BRENNAN

Tuffier, T., and Desmarres, R.: A Note on the Progress of Cicatrization of War Wounds. *J. Exp. Med.*, 1918, xxvii, 105.

The therapeutic effect of a physical or chemical agent on the cicatrization of wounds can be ascertained empirically, the authors state, from the rate of the process of cicatrization, and to demonstrate this effect scientifically it is necessary first to determine exactly the normal progress of a sterile wound, that is, the course of cicatrization in a given time, a unit of measure being thus obtained. When the normal progress of the cicatrization of a wound that is kept bacteriologically sterile is known, it becomes possible to study the changes taking place under physical or chemical influences.

The authors are aware that to subject organic processes to a mathematical formula is always a hazardous procedure. However, they believe that by eliminating certain causes of error and adopting the controlled conditions of experimentation, results can be obtained which show the exact coincidence of mathematical forecasts with clinical evidence. This parallelism, they believe, is constant and regular, and if it becomes irregular, it is due to an error in therapeutic methods, thus furnishing a means of control of the care given to the patient.

The present work is the result of observations on 20 cases in regard to the sterilization of the wounds as well as their rate of healing.

The authors point out that cicatrization results from two processes: contraction of connective tissue and epidermization, contraction being in reality a mechanical action connected with the appearance of granulations on the surface of the wound. It is also known from the work of du Noy that a sterile surface wound heals in a period of time which can almost invariably be predicted by a simple calculation. It has also been shown by du Noy that the index is clearly connected with the age of the patient and the initial surface of the wound; from a considerable number of observations, a short table has been constructed which, on the assumption that the wound is sterile, makes it possible to determine the index *a priori* after only one measure of the surface, when the age of the patient is known. The index varies approximately between 0.02 and 0.08.

From their experiments the authors suggest some hypothetical conclusions bearing on the evolution of cicatricial tissue. The arterial circulation deposits in the wound chemical substances necessary for contraction of the wound and for epithelial proliferation. When the biologic process was not hindered by any special or severe bacterial infection, this deposit was as regular as the circulation itself, and enabled them to determine in advance the date of cicatrization. It even seemed as though when the epidermization process was retarded by a slight infection, the substances necessary for epidermization were stored up in the wound, and when the delay due to infection was removed,

the epithelium found an accumulation of nutritive substances and, so to speak, made up the lost time.

Moreover, when an infection entirely or partially stopped epidermization, they observed that after the infection had disappeared the progress of new epidermization was much more rapid than normally; it even passed the calculated curve. The infection apparently left in the wound the chemical substances which activate epidermization.

The existence of these physical or chemical activating agents was indicated again by two anatomical clinical facts. In treating a scalp wound in which there was practically no epidermization for many months, they applied over the entire surface of the sterile wound dermo-epidermic grafts of fetal skin. After apparently taking, the grafts were absorbed and disappeared, but epidermization of the periphery of the wound, which hitherto had not progressed, took place abundantly, almost a hundred times as much as before.

The authors believe that by mathematical measurements the problem of the action of various organic fluids on the cicatrization of wounds can be solved.

GEORGE E. BURLAY

Rishmiller, J. H.: The Treatment of Surgical Shock. *J. Lancet*, 1918, xxxviii, 43.

The remedies employed are (1) adrenalin chloride; (2) pituitrin; (3) blood transfusion; (4) hypodermoclysis; (5) enteroclysis; (6) intravenous saline; (7) morphine.

The blood-pressure should be taken in every case, as digital estimation may be misleading. Operations on the lower extremity may be done under local anesthesia, since this by blocking nerves has a tendency to prevent shock.

The author reports a case in which there were very extensive crushing injuries, much loss of blood, and extreme shock. He adds conclusions taken from a previous paper on shock and its surgical significance in the *New York Medical Journal*, March 10 and 17, 1900:

1. Sensory nerve irritation of sufficient force to produce vasomotor exhaustion causes vascular nerve paralysis.
2. Children and the aged are very susceptible to shock.
3. Hemorrhage, especially venous, is the principal cause of shock.
4. There are two distinct varieties of shock (a) prostration with indifference, (b) prostration with excitement.
5. Peritoneal absorption of septic material causes death through shock before peritonitis can develop.
6. Subnormal temperature, irregular pulse, superficial respiration, cold anæmic extremities, and clammy perspiration contra indicate operation.
7. The severity of operative shock depends on the length of operation and the degree of anesthesia.

H. J. VAN DEN BERG

Gatellier: A Study of Shock in the Severely Wounded (*Contribution à l'étude du shock chez les grands blessés dans une ambulance de l'avant*). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 11.

In Gatellier's ambulance service 6,667 wounded have been observed since May, 1915. He has therefore had abundant opportunity to observe cases of shock. He divides shock into the nervous, hemorrhagic, toxic and septic varieties. The so-called pseudo-shocked cases due to exhaustion and cold are not included.

In hemorrhagic shock, no matter how desperate the condition, immediate operation is indicated. In 112 severe cases Gatellier operated in 103. The 9 others died before operation. Of the 103 operated cases, 66 recovered, 7 died. All were ligated. That is to say, ligature in full shock has given Gatellier 93 per cent recoveries. Ether is used as the anæsthetic and at the moment of ligating, an assistant injects 500 ccm. of adrenalized salt solution intravenously.

Gatellier distinguishes toxic shock from hemorrhagic and nervous shock. When such is found, it is generally in cases of large open muscular ruptures in the buttock or thigh regions, with fractures of the femur, etc.; the muscles are discolored and cold. There is a sort of stupor or death of the muscles. Gatellier thinks that the hæmostatic band aids in bringing about this condition of shock if left too long. He is of the opinion that shock in such cases is due to an intoxication aggravated by delay. Hence he favors immediate surgery. He either amputates at once or does a large myectomy. It is followed by injections of ether, serum, etc. Thirteen cases have been so treated and all have recovered. The removal of the source of toxin relieves the shock.

This immediate operative treatment of shock, at least of certain cases, would have previously appeared revolutionary or may even yet be so considered by many. Early operation under the conditions stated is considered by the author to be the essential treatment of shock and like all other war surgery is a matter of military organization.

W. A. BRENNAN.

Timme, W.: A Case of Pluriglandular Disturbance; Organotherapy; Cure. *Arch. Pediat.*, 1917, xxiv, 901.

The case of a boy is reported. His weight at birth was 5½ pounds; at the end of his first year, 23 pounds. Dentition was normal. Measles and pertussis occurred at 3 and 6½ years of age. Tonsillectomy was done two years before he was seen. Both testicles were undescended until 1½ years previous, but at examination they were in the inguinal canal.

The father had psychosis probably of a dementia præcox character, and also had a tendency to acromegaly. The grandmother had a mild case of hypothyroidism, as did one maternal uncle.

The Wassermann test proved negative. The boy's condition gradually became worse, he lost

weight, his fatigue became extreme, the fingers became purplish and swollen at times and the pus increased. In July, 1915, numbness in the extremities developed with increasingly painful paroxysms, especially at night. At these times paresthesia also supervened and sleep was almost impossible. On hot days the extremities were better.

When examined in December, 1915, the boy was seven and one-half years of age, poorly nourished, pale and anæmic. His posture and gait were normal; height was 46¾ inches, and weight 42¾ pounds. There was a generalized weakness of the entire musculature, but no atrophy, no tremor, and no inco-ordination. Blood-pressure was 80 systolic and 45 diastolic; pulse was 85 while at rest. The heart was normal, though its musculature seemed weak. There was a vasomotor paresis.

The boy lacked self-control, and was pugnacious and resentful, he was not amenable to discipline, and was impatient of his mother's criticisms, answering back with lowering brow and patent enmity. He took an interminable time to dress and undress for the examination and no amount of persuasion could change this. He lacked initiative and was becoming continually more dull and sluggish.

The radiograph showed a lack of development of the bony structures, and an X-ray of the skull showed a much contracted sella turcica, but with clear sinuses. The hair was lustreless and brittle.

Pituitary medication was begun December 14, 1915, in the form of whole gland capsules twice a day. Three drops of adrenalin in salt solution were given by mouth three times daily after meals.

By January 18, 1916, he had improved mentally. His stature had increased one-fourth of an inch; his weight was 43 pounds. As his weight gradually increased, it was thought wise to begin with small doses of thyroid, as this gland was second only to the pituitary in its deficiency. The adrenalin was stopped and thyroid, gr. 1:10, twice a day was ordered.

On October 21, 1916, his weight was 47 pounds; height 48¾ inches, a gain of 3¾ inches in height in nine months. Both testicles were well descended into the scrotal sac. The hair was glossy and smooth, the extremities in perfectly normal condition. His mental condition was excellent and undergoing the usual transitional period, childish antics and silly behavior, with a sunny disposition.

Examination on June 23, 1917, preparatory to going to a boy's camp for the summer, showed his weight 51¼ pounds, and height over 50 inches. The general condition of the body and organs was excellent. His mentality was also excellent. He was discharged as cured. EDWARD L. CORNELL.

Koch, W. F.: Tetany and the Parathyroid Glands. *Med. & Surg.*, 1918, ii, 9.

The author believes that the calcium deficiency has little to do with the essential etiology of parathyroid tetany, thus contradicting the findings of MacCallum, Voegtlin, Lambert and Vogel. Koch

finds methyl cyanamide in the urine of parathyroidectomized dogs. This substance was isolated from the urines of 47 dogs after parathyroidectomy, though in exceedingly small quantities, namely, 1.2 gr. of the picrolonate of the cyanamide and 2 gr. of the picrolonate of its polymer trimethylmelamine. Koch assumes that this substance is the mother substance of the guanidines, which induces intoxication symptoms. Koch suggests acid therapy instead of calcium therapy. It should be so regulated as to keep the guanidine production below the threshold of toxicity without producing a distinct acidosis. All that is necessary is to maintain the normal electric neutrality of the blood.

MAX KAHN.

Bernhard, A.: The Chemistry of Transudates and Exudates, with Reference to Their Non-Protein Nitrogenous Constituents. *Intern. M. J.*, 1918, xxv, 188.

The author concludes that his results show definitely that the non-protein nitrogenous constituents of transudates and exudates are comparable with the non-protein nitrogenous constituents of the blood, and that they are increased in nephritis with retention, while the sugar content of such fluids is increased in diabetes.

MAX KAHN.

SERA, VACCINES, AND FERMENTS

Krotoszyner, M.: Practical Value of the Complement Fixation Test for Gonorrhoea. *Calif. St. J. Med.*, 1918, xvi, 90.

Easily the most important article of the last few months for the urologist is the article on the gonorrhoeal fixation test. Every urologist in this country should study this article. Many of the author's statements are striking and convincing: "Several observations in which the positive reaction persisted on repetition of the test concerned old men with healthy wives and large families. In most of these cases a gonorrhoeal attack in early manhood was admitted."

Krotoszyner finds that 40.3 per cent of 66 cases of so-called sexual neurasthenia were positive. Again, "of 18 husbands, 16 had a positive and two a negative reaction. Both wives of the husbands with the negative reactions had a positive test."

The author tabulates his cases seriatim in tables. The laboratory work was done in the Pacific Wassermann Laboratory and checked by the German Hospital Laboratory.

The author's conclusions are worthy of being embodied entire because they are the result of an immense amount of study and large material. He studied 401 cases on which he made 500 complement fixation tests. His conclusions are:

Standardized technique and antigens are indispensable prerequisites toward rendering laboratory reports upon the complement fixation test for gonorrhoea more uniform and reliable.

The test is valueless for practical purposes, unless uniform reactions can be obtained in at least 80 per cent.

Only strongly positive reactions are of diagnostic significance and may occasionally lead to the detection of a hitherto unsuspected specific focus.

A weakly positive, or doubtful reaction is in all probability entirely valueless for practical purposes, since an old and non-infectious, encapsulated gonococcal focus may produce a strongly positive result, while a matrimonial candidate with an infectious urethro-prostatitis may exhibit a weak or negative reaction.

It is safe to say that the complement fixation test will never assume the importance for gonorrhoea that the Wassermann test possesses for syphilis.

A. C. STOKES.

BLOOD

McJunkin, F. A.: A Simple Technique for the Demonstration of a Phagocytic Mononuclear Cell in Peripheral Blood; First Report of Studies on the Mononuclear Cells of the Blood. *Arch. Int. Med.*, 1918, xvi, 59.

The purpose of this report is to describe a method by which a mononuclear cell constantly present in normal blood may be shown to be phagocytic, and to point out certain characters of the cell that suggest its origin.

Attempts at the identification and classification of non-lymphocytic mononuclear leucocytes have for the most part been based on staining characteristics. Methods dependent on the functional activities of the blood-cells have, however, been employed, and of these vital staining has attracted most attention. The usual statement of observers employing this method has been that cells which stain vitally did not appear in the peripheral blood, or appeared there in negligible numbers.

The method used was simple, but some of the details required considerable care in their execution. The object to be attained, the author states, is to bring the leucocytes into contact with fine particles of carbon at the body temperature and under exact and uniform conditions, and then to fix and stain them properly.

The functional behavior of fixed tissue cells was constantly made use of in their identification, and of the cell functions phagocytosis has been one of importance and has attracted a great deal of attention. In general, the phagocytic properties of the cells commonly met with are known. Fibroblasts, identified by the use of appropriate stains, rarely or never have been found to have incorporated foreign particles within their cytoplasm; none of the enormous number of lymphoblastic cells found in various normal and pathologic tissues were phagocytic, while polymorphonuclear neutrophils incorporated different bacteria and ingested non-bacterial substances.

In the lesions of typhoid fever, in tubercles and

in other pathologic processes, endothelial cells divided, became free and migrated through the vessel wall into the extravascular tissue. This was seen in single oil-immersion fields of tissue that were perfectly preserved. These free mononuclear leucocytes of endothelial origin were frequently phagocytic for other tissue cells, red blood-corpuscles, certain bacteria and for various non-bacterial particles such as carbon. The mononuclear cells of the blood shown by these experiments to be phagocytic for carbon corresponded in morphology and phagocytic properties to the endothelial leucocytes of the tissues, and it seemed to the author likely that this class of leucocytes might prove to be of endothelial origin. That they are not related to the polymorphonuclear leucocytes, he states, was clearly shown by their phagocytic properties.

In order to determine the behavior of tissue cells during life, certain coal tar and natural dyes were injected into animals intravenously and by other routes, and the tissues examined after a varying number of hours and days. Vitrally stained cells were said not to be present in the peripheral blood of the animal treated in this way, but granules of the stain were present in tissue cells spoken of as macrophages, which is a term implying that the cells containing the granules were capable of phagocytosis. The term phagocytosis, McJunkin states, is not correctly applied to the passage of a substance in solution into the protoplasm of a living cell, although it is there changed over into insoluble granules. He does not consider it possible to say whether all phagocytic cells are vitally staining or not, but certainly intravital staining as commonly carried out is useless for the demonstration of phagocytic cells in the blood.

Since none of the small mononuclear cells that were typical lymphocytes ingested the carbon, it was evident to the author that lymphocytes and phagocytic mononuclear cells were comprised in the mononuclear group of leucocytes. He believes that all of the phagocytic cells, owing to their resemblance to large lymphocytes especially, cannot be accurately identified by means of any of the blood stains now in common use without the employment of a reaction to determine their phagocytic properties.

GEORGE E. BEILBY.

Meleney, F. L.: A Study of Ante-Operative and Postoperative Blood Counts in Non-Infective Surgical Conditions. *Ann. Surg.*, Phila., 1918, LVII, 129.

With the purpose of finding out the extent of postoperative leucocytosis in man and also arriving if possible at some conclusions regarding the prime factors in its production, 31 cases were studied in the wards of the Presbyterian Hospital. These cases were chosen at random, the only cases not accepted in the series being those in which an acute infection was present before operation or a marked infection expected after it.

An ante-operative count was made on the afternoon before the morning operation; in only a very few cases count was made just before operation. A second count was made on the afternoon of the day of operation, approximately six hours after operation. Another count was made every afternoon following until it returned either to normal or to the initial count. In making averages, those cases which fell to normal before the twelfth day were considered to maintain their final count until that day.

The findings were as follows:

In surgical cases undergoing operation without infection, the white cells increase in number and about six hours after operation have more than doubled.

The response is due almost entirely to the outpouring of polymorphonuclear cells.

There is a trivial rise in red cells after operation, but in the subsequent ten days this is followed by a progressive anemia with an average loss of about one-half million cells per cmm.

The white cell count may be expected to fall rapidly in clean cases and reach normal on the fourth day. In infected or contaminated cases it will fall much more slowly.

Infection and contamination have nothing to do with the initial rise, but on the second or third day after operation they will tend to keep the count high.

Other things being equal, the count will be higher in those cases in which there is severe trauma to the tissues, many sutures and ligatures used, considerable loss of blood and long anesthesia, especially with ether.

Normal individuals will produce a higher leucocytosis than abnormal types.

EDWARD L. CORNELL.

Propping, C.: Gangrene Due to Ligation of Important Arteries. *Muenchen. med. Wochenschr.*, 1917, No. 18.

The author points out that in 1916 Sehrt recommended that in ligating an important artery, ligation of the corresponding vein should be done. Sehrt explained that the capillary supply in the region may be insufficient owing to a too rapid venous deflux and the nutrition of the region may suffer, giving rise to gangrene. The cause of such a gangrene is not due to a want of collateral circulation, but is the result of a disproportion between the collateral arterial flow and the venous deflux which causes a disturbance in the equilibrium of these two factors.

Gangrene of a limb is more frequent after ligation of the artery alone. Sehrt found that in the lower limb there was gangrene after ligation of an artery alone in 20 per cent of the cases, but after simultaneous ligation of the artery and corresponding vein there was gangrene in only 9 per cent of the cases. In the upper limb after ligation of the artery, gangrene occurred in 7.8 per cent of cases, but there was

no case of gangrene after ligation of the artery and vein. The smaller percentage of gangrene in the upper limb is accounted for by the larger number of veins.

The practical results of the proposal to ligate both artery and vein seem to be to cure stasis by means of stasis; to meet the diminution of the capillary current by a restriction of the venous deflux and re-establish the disturbed equilibrium between inflow and outflow. In cases where gangrene is threatened, the contemporaneous ligation of artery and its accompanying vein is counseled. The author particularly recommends ligation of the internal jugular vein when the internal carotid is ligated.

W. A. BRENNAN.

Newell, E. D.: Blood Transfusion in Emergency Surgery; Sodium Citrate; Indirect Method. *South. M. J.*, 1918, XI, 143.

Newell favors the sodium citrate method of transfusion. The advantages he cites as follows: (1) the equipment is inexpensive and always at hand; (2) the technique is quick and as simple as an intravenous infusion; (3) no trained assistants are necessary; (4) the donor need not be in the same room with the recipient; no psychology; the recipient need not even be removed from the bed; (5) no blood-vessels are divided or destroyed; no ugly scars are left; (6) the quantity given can be accurately measured; and there is no clotting of blood.

He lists the following disadvantages: (1) possible biological changes in the blood; this, however, is to be ascertained by further investigation; (2) chills occur after administration of citrated blood in twenty to twenty-five per cent of cases, but they are never serious; (3) possible toxicity of the blood if extremely large quantities of the citrated solution are given, but 2,500 ccm. of a 0.2 per cent solution can be given before the average dose is obtained, and this quantity is seldom, if ever, administered at one sitting.

The technique that Newell recommends is a combination of the Lindemann and Lewisohn methods. Drawing the blood first into a 200 ccm. syringe containing 2 ccm. of a 2 per cent sodium citrate solution, this is injected into the vein of the recipient and ten to fifteen minutes are allowed to elapse to await developments. If there is no anaphylactic action, two 200 ccm. syringes full of blood with the requisite amount of sodium citrate solution in them are drawn off and injected through a smaller needle into the recipient at pleasure. After the first 200 ccm. are administered, the syringe may be disconnected from the needle and the second syringe attached to the same needle.

The syringes with the citrated blood can be kept stored at almost any temperature, transported any reasonable distance, and used at the pleasure of the physician. There is no change in the blood from contact with air, with the graduate, rod, or gravity outfit with its long tubing. This method,

which requires three syringes with two needles, brings transfusion down to the plane of intravenous medication.

ALBERT FURBERG.

Speldel, W. C.: Transfusion of Blood by the Direct Method with Observations Covering an Experience with over Forty Transfusion Operations. *Northwest Med.*, 1918, XVII, 44.

Among the cases treated are 16 of pellagra, 7 of pernicious anemia, water gas, carbon monoxide poisoning, crushing injury of the leg, gunshot wound of the leg, stab wound of the chest with hemothorax, hemorrhage neonatorum, puerperal sepsis, thyroidectomy plus hemorrhage, intestinal hemorrhage due to eroding duodenal ulcer, cases in which transfusion proved of sustaining and palliative value, but in some of which the results were materially complicated by the accompanying state of severe hemolytic infection or extreme condition of shock.

The author does an arteriovenous anastomosis by means of the Elsberg modification of the Crile cannula and has found it most satisfactory and comparatively simple over that of the Crile cannula which was used in the pellagra cases mentioned. As an additional step to the usual technique, the author makes a practice of suturing the cut ends of the radial artery.

EDWARD L. CORNELL.

BLOOD AND LYMPH VESSELS

Donati, M.: Wounds of Blood-Vessels of the Limb. (*Ferite dei vasi sanguigni degli arti*). *Chir. d. organ. d. mov.*, Bologna, 1917, I, 191.

The author reports 46 war injuries of blood-vessels of the limb observed by him in one of the Italian territorial hospitals. Of these, 18 were bullet wounds, 14 grenade injuries, 7 shrapnel and 7 bomb wounds. In 2 cases the vascular injury was a through-and-through perforation; in 23 it was a lateral wound causing some loss in the substance of the vascular wall, in 19 cases there was total laceration or complete section of the vessel. Eighteen of the cases were associated with bone fractures, and 12 with nerve lesions.

The author gives a detailed history with a discussion of each of the 46 cases. Many of the cases are illustrated.

In summing up his experience from the great variety and degree of gravity of these lesions, the author is impressed by the importance of immediate surgical intervention. Definite hemostasis can then be made with the least danger in the as yet uninfected areas, and non-suspected lesions in important vessels are discovered and repaired. Such rational intervention, also, by widely opening up the track of the wound and finding the exact lesions of the bones and soft parts, will frequently obviate later interventions for secondary hemorrhage, hematomata and aneurisms.

Once a vascular lesion is diagnosed, whatever its nature may be, immediate operation is justified. Delay should be considered only in such special

Cases as true aneurisms of small volume, not infected and not involving neighboring nerve-trunks.

Operation in the majority of cases will consist in ligaturing in healthy tissue above and below the injured segment of the vessel with or without excision of the segment itself.

The ideal treatment, viz., repair of the vascular lesion with immediate reconstruction of the vessel lumen, cannot be realized since it calls for special conditions of asepsis, but this can be effected in a secondary operation for arterial or arteriovenous aneurisms.

In particular cases and with suitable conditions, the author recommends the temporary intubation of the injured artery with paraffinated silver tubes, according to Tuffier's technique. This procedure avoids the sudden arrest of the circulation and favors dilatation of the collateral vessels. The author thinks that the success of this method merits its trial in recent injuries of the limb vessels, especially if associated with fractures or multiple wounds, in order to avoid the danger of gangrene.

The author has never used the compressive tampon to secure hemostasis, nor has he found that this was effective in those cases coming to him in which it had been done.

W. A. BRENNAN.

POISONS

Hopkins, J. G., and Parker, J. T.: The Effect of Injections of Hemolytic Streptococci on Susceptible and Insusceptible Animals. *J. Exp. Med.*, 1918, xxvii, 1.

The observations recorded in this paper were made in the course of a study of streptococcus infection and immunity. In order to study the problem of the immunization of animals against streptococcus infection, it was necessary first to obtain as clear a picture as possible of the course of the infection in untreated animals. It has been noted by other workers, and borne out by the present investigations, that bacteria introduced into the circulation of the living animals quickly disappeared. It was the authors' first task to study this phenomenon and if possible to find some means of explaining it.

They found that with hemolytic streptococci which were of rather low virulence for rabbits, a sublethal dose completely disappeared from the blood stream within a few hours. When a lethal injection was given, over 90 per cent of the cocci were removed from the circulation within the first few minutes, and subsequent blood cultures reached a minimum in two to three hours, but after four to six hours the number again began to increase. Even with lethal doses, cultures of 1 ccm. of blood showed no colonies after two or three hours, but as a rule streptococci did not completely disappear after such an injection.

As an example of complete removal, a rabbit was injected with 5 ccm. of a heavy suspension of streptococcus 43. Cultures taken immediately

showed several thousand organisms per 1 ccm. of blood. After ten minutes, five drops of blood showed only 23, and after thirty minutes, 5; after one hour, two hours, four and one-half hours, eleven and one-half hours, and twenty-six hours, 1, 0, 6, 17 and 218 organisms respectively.

The blood cultures subsequent to those recorded in the experiment were consistently positive until the death of the animal on the fourth day. The prompt and almost invariable removal of organisms artificially introduced into the circulation was difficult to harmonize with the fact that in susceptible animals the organisms again appeared in the blood within four to twelve hours, and were found constantly in the circulation until death, as in cases of spontaneous septicæmia.

The authors advance four hypotheses which they believe might account for this: first, that after a period the blood-sterilizing mechanism became exhausted and permitted bacteria to remain in the circulation; second, that the bacteria after a brief stay within the body became resistant to its defensive powers; third, that the injection of foreign-protein stimulated some reaction such as a mobilization of antibodies, or of phagocytes, which would account for the prompt and extensive preliminary removal of the bacteria; fourth, that the bacteria did not multiply in the circulation, but were continually introduced from infected tissues faster than they could be removed.

Then follows a series of experiments to confirm or disprove these various hypotheses. As a result of these experiments the authors draw the following conclusions:

Streptococci injected into the circulation of cats were quickly withdrawn and were found most numerous in the lung, less numerous in the liver and spleen, and in small numbers in the bone-marrow, lymph-nodes, muscle, and kidney.

The streptococci taken up by the lung were killed within five to seven hours, although they remained visible in films for a number of days. In the liver they were killed less rapidly, and in the spleen a few remained viable for a considerable period.

This bactericidal action was demonstrated in pieces of excised lung but not in lung extracts, and was apparently dependent on the action of the living cell.

Streptococci injected into a susceptible animal, the rabbit, were also promptly removed from the circulation, but were distributed in different proportions, the liver and spleen absorbing almost as many as the lung, and the muscles also taking up an appreciable number.

As in the cat, the organisms taken up by the lung and liver of the living rabbit were promptly killed. Those which lodged in the muscles, however, multiplied rapidly.

About the time that the streptococci began to develop in the muscles, four to eight hours after injection, the number in the blood stream began to increase.

The increase in the blood stream was not due to exhaustion of the mechanism of their removal nor had these organisms acquired a resistance sufficient to maintain them in the blood stream of a normal animal. The septicæmia, then, the authors believe to be a probable result of washing out of organisms from the infected tissues.

Attempts to immunize rabbits were unsuccessful, but in certain treated animals the distribution of the organisms among the various organs approached that found in insusceptible animals, i.e., cats.

GEORGE E. BELLBY.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Dederer, C.: Studies in the Transplantation of Whole Organs: Autotransplant of the Left Kidney to the Neck with Right Nephrectomy in the Dog. *J. Am. Med. Ass.* 1918, lxx, 6.

The author gives his observations from experiments on dogs in which the left kidney was transplanted to the neck, with a right nephrectomy later. The conclusions are as follows:

1. It is possible for a dog to remain alive and in good health more than four months after the transplantation of one kidney to the neck, even when the remaining kidney is removed two weeks after the transplantation.

2. After the transplantation of a kidney with its ureter, the ureter may be seen to move when contracting during excretion.

3. The ureter in a renal transplant may have the power to squirt the urine away from the animal by periodic contractions.

4. Phenolsulphonephthalein may return in four minutes from a transplanted kidney.

5. Many branches from the second cervical nerve may, in seventeen days, become intimately incorporated in the perineal tissues of a cervical renal transplant.

6. The quantity of urine from a cervical renal transplant is markedly increased after the removal of the other kidney.

7. The neck is a favorable site for the observation of an experimentally transplanted kidney and its excretion.

C. A. BOWERS.

ROENTGENOLOGY

Shenton, E. W. H.: X-Ray Localization. *Lancet*, Lond., 1918, cxciv, 2.

Where time permits and photography is desirable, the method described by the author has in its favor accuracy, rapidity and simplicity. He has used it since 1915 for all kinds of localization, including minute fragments in the eye. The apparatus needed is two empty plate boxes, a sheet of paper, and a pencil.

On the top and bottom of the two empty plate boxes is placed a plate, film side down in a light proof wrapper. The two plates are thus separated by the two boxes, the films downward, and the whole held together by elastic bands. The measurement from one film surface to the other is taken and holds for all future work as well. A special holder separating the plates 3 or 10 cm. may be used.

The plates with the boxes between are placed over the foreign body. The lowest plate, with film side downward, touches the skin. This position presupposes that the tube is below the table. The first exposure is made with the tube a little to one side of the object, and a second exposure, without moving the plates, is made after moving the tube somewhat to the opposite side. Thus, when the plates are developed, each plate will show two images. Those on the plate touching the skin will be closer than those on the plate separated by the two boxes.

Erect two perpendiculars to the edge of a sheet of paper separated by the measured distance between the two plate films. On one perpendicular mark a point from the edge of the paper equal to the distance between the two images on the first plate. On the other perpendicular, mark a point from the edge of the paper equal to the distance between the two images on the second plate. The distances between the images must be measured from similar points on each. Draw a line to the edge of the paper passing through the points on each perpendicular. The distance between the perpendicular which represents the film touching the skin, and the point where the oblique line reaches the edge of the paper, shows the depth of the object. C. B. HOLLINGS.

MILITARY SURGERY

NOTE.—Readers are referred to the Table of Contents for other articles dealing with military surgery which appear under the various headings according to our anatomical arrangement.

Hazen, H. H.: Syphilis and the War. *Am. J. Syphilis* 1918, ii, 144.

Increase of syphilis during war times among soldiers and civilians is an established fact. The method of controlling venereal disease, according to available statistics, has been less successfully developed in the United States than in other large

countries. A special committee appointed for developing more successful treatment advises:

1. Complete case records.
2. Early diagnosis, clinical, microscopic and serologic.
3. Calomel treatment of chancre in preference to excision.

4. Salvarsan and mercurial treatment, both strongly pushed. Monthly Wassermann tests to control the dosage.

5. In late cases without serious lesions, mercury and potassium iodide until symptoms subside, preferably until the Wassermann test is negative.

Special prophylactic and hygienic measures are recommended; also examinations of all men before discharge from the army, and compulsory treatment of all cases. Western Australia has enforced stringent laws with success. LISTER TUHOISKE.

Campbell, J.: The Treatment in the Field of Uncontrollable Hemorrhage in Gunshot Wound. *Lancet*, Lond., 1918, cxiv, 295.

Open gunshot wounds of the neck involving the large vessels are usually immediately fatal on the battlefield. Even those that do come under the care of the medical officer usually die because of the inadequacy of the customary methods of packing or digital pressure. Conversion of an open bleeding wound into a closed one by skin and fascial suture or by artery forceps stops bleeding by tension from resulting hematoma.

A case is cited of a shell fragment tear three-eighths of an inch long in the common carotid and involving half its circumference, in which bleeding was effectually controlled by two Spencer-Wells forceps. C. A. HEDBLUM.

Billot, G.: The First Line Dressing Station and the First Dressing. *N. Y. M. J.*, 1918, cvii, 313.

The objects of the first dressing are control of pain, hemorrhage and infection. The first dressing acts as an anodyne. All wounds should be treated on the supposition that they are already infected, as a preventive treatment of gangrene and infections. The means of controlling hemorrhage are the tourniquet, compression, and ligature. Ligature and compression are the better methods to be employed.

For control of infection, alcohol and iodine have not been successful because of the coagulating action on albuminoids. Dakin's solution has proven most satisfactory.

At the first dressing the wound is cleansed with 14 per cent salt solution and a light gauze dressing applied which is impregnated with Dakin's solution; this is covered with a thin layer of non-absorbent cotton. Fresh solution is introduced at two-hour intervals. It is essential that all parts of the wound should be in contact with the solution so that all infected closed cavities should be opened, and that the action of the medicament should be continuous. Antitetanic serum should be a routine measure. I. E. BISHOP.

Guillot, M., and Wolmant, H.: Closure of War Wounds in the Base Hospitals (Fermeture des fractures de guerre dans les formations de l'arrière). *J. de chir.*, Par., 1918, xiv, 217.

The application of the Carrel method for sterilization and closure of fresh wounds is well known,

but its extension to cases of old fractures or those with established fistula is less known. The authors have carried out this procedure since September, 1916, and now report on the first 30 cases so treated. One of the greatest advantages of this treatment is that it affords a means of obviating bony fistula. This is especially important as 50 per cent of thigh fracture cases, according to the authors, which do not die or are not amputated remain fistulous after twelve months of treatment.

The technique followed by the authors consists in: (a) primary disinfection by the Carrel-Dakin method; (b) operative treatment; (c) sterilization of the area; (d) closure.

In the course of disinfection a rise in the bacteriologic curve indicates the existence of some bacterial focus in the wound. It may be necrotic tendon, aponeurosis, osteitis, sequestrum, debris, etc.; but whatever it is must be removed surgically. The surgical treatment of the flat bones or of the epiphyses of the long bones does not offer any difficulty; but fractures of the long bones do. It is not enough to remove sequestra nor to curette osteitic areas. The authors think it necessary to deal in order with the following: (1) incision; (2) the periosteal callus; (3) the sequestra; (4) bone fragments, etc.; (5) the bone extremities.

All the serious complications which the authors have observed after intervention on infected fractures are connected with the persistence of the opening of one or both medullary canals. The operation activates the bacteria and gives them an area in which they can multiply. It is usual to find that an open bone extremity gives rise to an intense reaction if the cavity of the non-obtured medullary canal has not been largely exposed to irrigation of the antiseptic. When certain precautions are observed, however, osseous non-obtured extremities if opened surgically do not give rise to any reaction.

The authors therefore have certain rules for the treatment of osseous extremities. These are:

1. Obturating medullary plugs should be superficially abraded by the curette so as to assure no communication with the medullary canal, nor any included sequestra. If the surface thus explored is healthy, the obturation will be respected.

2. Medullary canals remaining open should be cleared by the gouge so as to give easy access to irrigating drains.

After sterilization closure does not usually present any difficulties. When it is impossible to close without filling an old bone cavity the authors prefer to use a fat graft, but this must be reserved for cases in which the production of periosteal callus is advanced, else there is a likelihood of a pseudarthrosis.

The results of 50 treatments of old fractures since September, 1916, gave 11 closures, 23 cleared spontaneously, and 2 after closure have developed a fistula. These fractures included 11 humeral and 6 tibial fractures and the time between injury and beginning of treatment varied from two days to

seven months. For the fractures that have been closed the average time of treatment before closure was 43 days. The average for the most recently treated cases has been 26 days. The authors state that it is possible to treat 75 per cent of the most difficult old fractures after an average duration of treatment lasting 26 days. W. A. BRIDGMAN.

Martin, W.: Lessons Taught by the War in the Treatment of Gunshot Injuries. *S. F. M. J.*, 1918, CVII, 315.

The chief consideration is getting a wounded man to a well-equipped hospital in the minimum of time. This, of course, depends upon the enemy's fire, as ambulances are systematically shelled and the wounded can only be moved at nightfall. At Verdun it was twenty-four hours before the wounded reached surgical care.

In this war the type of injury differs from other wars; 80.5 per cent of wounds are caused by artillery projectiles; all wounds are extensively infected and contain foreign bodies. A vital point is the perfection of means of transportation as, with a delay of twenty-four hours, bacteria in a wound might increase to many millions. Therefore there is a need for experienced surgeons as near the line as possible and X-ray apparatus should be as near as possible to the advanced post. EDWARD L. CORNELL.

Burkitt, E. H.: Surgical Notes from the Western Front During the Summer Fighting of 1917. *Med. J. Austral.*, 1918, I, 22.

The author reviews the work of casualty clearing stations during the summer campaign of 1917, and points out the training advantages from the work of their stations. Arrangement has been made for reinforcement by surgical teams consisting of a surgeon, anesthetist, theater sister, and one or two orderlies, from quiet sectors to those under fire. During an attack, teams worked sixteen hours out of seventy-four. During the first twenty hours of the Messines attack, 2,067 wounded were received and 2,000 evacuated.

Upon arrival at the clearing station, the patients are rapidly sorted, the minor wounds being cared for in dressing tents, those badly shocked going to resuscitating wards, while those needing X-ray are photographed. Notes on findings are either sketched on the surface or put on a card placed in a bag which each patient receives on entering. The amount of effort and time in searching for foreign bodies is left to the surgeon's judgment, but the author feels that failure means anaerobic infection.

Notes of all operations are dictated by the surgeon, and accompany the patients to the base. In the treatment of infected wounds after a preliminary soap and water scrub, the wound area is rubbed with methylated spirits and painted with 5 per cent picric acid. Small wounds are excised; in larger ones, if very foul, a one per cent saturated solution of permanganate of potassium in hydrogen

peroxide is used. Following this, every shred of dead or infected material is dissected away, the wound being enlarged if necessary. Long sutures are placed in position but not tied.

The subsequent treatment may be either the Carrel-Dakin, "bipp," or salt pack. The Carrel tubes must be so placed and regulated that every part of the wound is filled with the solution at least every two hours. The "bipp" is carefully spread into every part of the wound, a few layers of gauze are applied over it, the wound is filled with loose gauze saturated with liquid paraffin, and the sutures are loosely tied. Every three days the dressings are re-applied and the sutures tightened.

Compound fractures are splinted in the ambulance and at the casualty station, the infected bone ends cut away, bones put into proper position, and the wound treated as any other infected wound.

Many head wounds are treated under local anesthetic with an elastic band about the head to control hemorrhage. Small openings are made if possible, but the author emphasizes the danger of large fractures to the inner table when only slight damage has been done to the outer table. The dura should not be opened unless wounded. Foreign bodies are removed if they can be reached with the finger, and macerated tissue removed. The wound is closed with drainage.

Chest surgery is becoming somewhat less radical. The surface wound is closed, hemothorax is aspirated and examined; if positive, rib resection is done and Dakin's solution instilled, and fresh specimens examined every two days. Accessible foreign bodies are removed.

The wounded abdomen is thoroughly explored, wounded intestines sutured or anastomosed, soiled areas washed with Dakin's solution; hematomata are carefully drained. Of the injured, 47.5 per cent were evacuated.

Special care is required in knee-joint surgery to avoid sepsis, but foreign bodies are removed, and the wound either closed or given Carrel treatment as required.

In conclusion, the author speaks highly of the anesthesia, especially recommending warm ether and nitrous oxide and ether.

H. J. VAN DEN BERG.

Borden, R. P.: War Hospitals in the United States. *N. Y. M. J.*, 1918, CVII, 339.

The author makes a plea for the use of present civilian hospital facilities for military purposes wherever possible. The essence of a hospital, its true reason for being, is its administrative department, including operating rooms, laboratories, X-ray rooms, supply rooms, quarters for nurses and physicians, etc. It so happens that these facilities are capable of largely increased use, and that if the bed capacity were enlarged, the use of these departments would be very greatly augmented. Construction could be concentrated on bed capacity. Most hospital apparatus and instruments may be

repeatedly used as long as there are patients who require them.

Although of course the paramount consideration is the physical restoration of our citizen soldiery, nevertheless the present exigency will in time cease and then unnecessary duplication of construction and equipment will result in a tremendous waste. When the period of readjustment comes, the financial situation will be an important factor in the welfare of the citizen.

The product of the medical schools must be finished by education in hospitals, as in such manner only can surgeons be trained. England realizes the mistake of sending embryo doctors without hospital experience into her military hospitals. By sending the returned soldiers to existing hospitals, it is possible for them to be taken care of by the men who were by reason of infirmity or other conditions unable to engage in foreign service, and at the same time allow these men to carry on the work of educating a new supply of physicians. The army requires such a large number of trained nurses that training schools dare not be interfered with, and physicians and leading nurses are necessary for this.

Plans have been considered for reconstruction hospitals, mainly orthopedic. The result would be a number of special hospitals with duplication of buildings, equipment, personnel, etc. Machinery would be costly and the opportunity for its use short, while the same installation in an established hospital could be continued in use for civilian purposes long after the need for military use has disappeared.

The chief objections raised to the use of the civilian hospitals have been that there would be a loss of military discipline and control. The former can be easily overcome by segregating all military patients and continuing all disciplinary measures. The second can be met by having provisions for keeping records, for military inspection, etc.

The author would establish military zones, consisting of one or a group of hospitals. To each zone would be sent military officers and men as needed to take care of the patients. The hospital would have to conform to certain requirements, including compensation, necessary bed space, and construction of additional wards if necessary.

R. B. BITTMAN.

Owen, W. O.: *The Proper Organization of the Medical Profession of the Nation at War.* *South. M. J.*, 1917, 3, 928.

The author outlines a plan for the organization of the medical profession as a whole in order to intelligently select the best men to care for the army in such a manner that the civilian population will not be neglected. In addition he describes the difference between civil and military practice and indicates the relationship of the military medical officer to his men, to his superior officers, and to his co-workers, and ends with a plea for the assumption of medical and surgical superiority of the world by America's medical profession. H. H. FROTHINGHAM.

Poate, H. R. G.: *Re-Education of the Disabled Soldier.* *Med. J. Austral.*, 1918, 1, 2.

This article is a review of reconstruction work as done in England and France with suggestions as to the best manner of providing for the disabled soldiers in Australia.

There is a great need for orthopedic centers in the capital cities of each State. All men who can be benefited by treatment as carried out in the French centers of physiotherapy should be transferred to these hospitals and kept until all has been done for them that is humanly possible.

In close association with these hospitals should be a series of workshops where men can attend and learn a trade.

The establishment of centers of surgical equipment for the manufacture and repair of artificial limbs and all orthopedic appliances should be necessary and would provide a training ground for many men.

Special instruction should be provided for advanced pupils where they may be trained for highly skilled or unusual trades.

In order to place a man finally, when competent, to earn an independent living, it should be incumbent upon the authorities to establish an employment bureau, and to keep in touch with both employers and employees.

The medical profession as a body should play its part wholeheartedly, and should insist on being heard in this matter at once, so that no further time may be lost.

R. B. COFFIN.

GYNECOLOGY

UTERUS

Russ, W. B., and Wilson, H. T.: Fibrosis Uteri. *Texas St. J. Med.*, 1918, xiii, 346.

The pathologic processes underlying the cases of menorrhagia and metrorrhagia caused by cancer, fibroids, polypa, inflammatory changes in the uterus and adnexa, certain constitutional diseases such as syphilis and tuberculosis, are fairly definite and well understood. But there are cases of menorrhagia and metrorrhagia in which no recognizable anatomic changes or other cause to account for the hemorrhage can be found.

These cases of fibrosis uteri, so called, are most frequently found in multiparæ about the menopause. They are, however, by no means infrequent in nulliparæ and in women who are far below the climacteric age. A case in a nineteen-year-old girl has been reported by Pool.

Formerly, when it was believed that the increase in the fibrous tissue in the myometrium was the essential factor in causing hemorrhage, it was thought that the fibrous tissue prevented the uterine muscle from contracting sufficiently to close the veins and sinuses.

Spontaneous cures argue strongly against the theory that the fibrous tissue in the myometrium is the essential factor in the causation of the form of metrorrhagia under discussion. It is reasonable to conceive of a readjustment of the activity of any of the endocrine glands which would re-establish the normal physiology of the pelvic organs. By such a change, any pathologic hemorrhage from the uterus would be checked.

There is abundant evidence to show that the endocrine glands may be intimately concerned in the disease which causes fibrosis uteri; even more, they may be the primary seat of the trouble. Perverted follicular activity of the ovary and diminished secretion of the thyroid gland seem to be the most probable conditions underlying this disorder. They may act independently or reciprocally.

Until the cause of this condition has been more accurately determined, the ideal treatment cannot be outlined. Local applications and medicinal measures are of no avail. Curettement affords only temporary relief and should not be resorted to except for diagnostic purposes. Extreme care should be taken to ascertain whether or not there is deficient secretion of the thyroid gland. If the signs of hypothyroidism are present, the exhibition of thyroid extract is indicated.

Roentgenization of the ovaries should be employed, for this will control the bleeding in many cases where it is due to disturbed ovarian function.

EDWARD L. CORNELL.

Ward, F. N.: Procidentia in Nulliparous Women: Report of Seven Cases with Surgical Measures Devised for Their Relief. *J. Am. Inst. Homœop.*, 1918, x, 884.

The author defines procidentia in the nullipara as the third degree of uterine prolapse, where the uterus protrudes beyond the vulva with complete eversion of the vaginal walls. It occurs in those who do heavy lifting. Retroversion is the predisposing factor. Three requirements are essential for the correction of this condition:

1. The uterus must be brought to the normal position with the fundus toward the pubes and with the intra-abdominal pressure coming upon its posterior surface.

2. The utero-vesical-vaginal area must be restored to its normal tonicity so as to do away with the cystocele.

3. The perineal body must be brought to its position just beneath the pubic arch.

The first step in the operation is a high amputation of the cervix and a restoration of the relaxed vaginal outlet. The abdomen is opened and relaxed vesico-uterine space plicated by Polk's method. The uterus is fixed to the fascia or in extreme cases may be bisected and sutured to the upper surface of the fascia. If hysterectomy is necessary, as for fibroids, the stump of the cervix is sutured to the muscle and fascia with linen. The author reports eight cases with cure in all.

S. A. CHALFANT.

Worrall, R.: The Technique of Total Hysterectomy for Non-Malignant Conditions. *Am. J. Obst.*, N. Y., 1917, lxxvi, 894.

There is still some difference of opinion as to whether subtotal or total hysterectomy should be done when removal of the uterus is necessary for myoma or other non-malignant conditions.

The author after a preliminary injection of tincture of iodine into the uterine cavity, with sometimes closure of the os with catgut, opens the abdomen in the median line. Each round ligament is held up, clipped and divided. Through the space thus opened up in the anterior layer of each broad ligament the finger is thrust; the vascular arch above containing the ovarian vessels is divided on the uterine side of the ovaries, which are left if healthy.

The peritoneum between the cut round ligament is divided and the bladder dissected down with the scissors. The uterine vessels are clamped below the inner os. The musculature of the cervix is then incised all around penetrating half-way toward the canal; the direction of the cut is then directed downward until the external os is reached, when the circumference of the cut is expanded so as to include all the external os.

The mucosa of the vagina is united to the serosa anteriorly by a figure-of-eight catgut suture, the same is done posteriorly; the two sutures are then used as tractors by which to pull up the field of operation nearer the operator. Sutures on each side close the lateral angles of the opening into the vagina and check oozing. Tying of the two traction sutures closes the central portion of the opening. The artery clamps are replaced by ligatures; a purse-string suture on each side closes up the broad ligament, takes in the stump of the round ligaments and unites these to the rim of the cervix. When tied they secure the ovaries so that their vascular supply is not unfavorably affected.

This operation can be done in from thirty to sixty minutes according to conditions. The author thinks that this method meets all the objections to both total and subtotal hysterectomy as usually performed for non-malignant conditions.

W. A. BRENNAN.

ADNEXAL AND PERIUTERINE CONDITIONS

Waters, C. H.: *Hæmorrhage into an Ovarian Cyst Simulating Ectopic Pregnancy.* *J. Am. M. Ass.*, 1918, lxx, 295.

The patient, aged 28, a secundipara, was one week overdue with menstruation. She was in good general health and menstruation had been entirely regular and normal previously except for some slight discomfort until the flow was established. The cervix was of normal consistency, the fundus not enlarged; both ovaries were distinctly palpable, the left being slightly enlarged and tender. The adnexa otherwise were negative. Three days later the patient was suffering with severe abdominal pain and flowing profusely. During the night colic-like pains in the lower abdomen occurred, increasing in severity, and accompanied by diarrhoea and a profuse vaginal flow. Large clots of blood and fragments of "tissue" were passed. The patient's temperature was 101 and the pulse rate 90 and of good quality. There was marked tenderness and rigidity on the left side of the lower abdomen, but no mass could be felt and no free fluid was demonstrable. Nausea was present, but no vomiting.

Bimanual examination revealed the same condition of the uterus and cervix as was found several days previously, except that the external os was slightly patulous. On the left side of the pelvis, however, a tender globular and cystic mass the size of a goose egg could be determined. It was but slightly movable and corresponded in position to the ampullary region of the tube or the ovary. There was no bulging of the cul-de-sac.

The tissue passed by the vagina was found to consist of practically a complete triangular cast of the uterine cavity. Microscopically, the cast was shown to be a rather hyperplastic endometrium, but it showed no decidual reaction or the presence of decidual cells.

During the next week the pain became less severe, though persistent, and the flow practically ceased. The temperature varied from normal to 100, while the pulse rate rarely exceeded 90. Loss of appetite and occasional nausea persisted. There was no demonstrable change in the pelvic condition noted previously. As there was no appreciable improvement in the local condition, operation was decided upon.

A transverse incision revealed no free blood in the peritoneal cavity. The uterus was not enlarged; it was in midposition. The left ovary was transformed into a dark, tense cyst the size of a small apple. There was no torsion of its pedicle. The right ovary contained a corpus luteum of normal appearance. Both tubes were normal. Left ovariectomy, Willis' operation for shortening the round ligaments, and appendectomy were followed by dilatation of the cervix and curettage.

Convalescence was uneventful and menstruation since has been entirely painless and otherwise normal.

EDWARD L. CORNELL.

EXTERNAL GENITALIA

Carstens, J. H.: *Gall-Bladder Trouble Complicating Disease of the Internal Genitalia.* *Am. J. Obst.*, N. Y., 1917, lxxvi, 936.

The author refers to the gradual modern development of gynecology into pelvic and abdominal surgery. The gynecologist must know the abdomen, be able to make a correct diagnosis, and be prepared to treat any abdominal condition surgically.

Many women with pelvic troubles also have gall-bladder disease as well as diseases in other organs of the upper abdomen. No patient with even simple pelvic disease should be operated upon unless a thorough examination has been made of all the abdominal organs. If there is any doubt of the condition, the incision should be made large enough so that the whole abdomen can be explored. In all pelvic operations where gall-bladder disease exists, the latter should be operated upon at the same time, provided that the patient's life is not endangered by prolonging the operation.

W. A. BRENNAN.

MISCELLANEOUS

Boldt, H. J.: *The Surgical Treatment of Cancer.* *Med. Rec.*, 1918, xciii, 62.

The author has taken up the treatment of cancer from the standpoint of the gynecologist.

A permanent cure is possible in cancer of the uterus only when the cancer is still a local disease and when an opportunity is afforded to operate in the early stages and well away from malignant invasion.

The author uses the vaginal method of hysterectomy if the patient is obese and the disease is still in its incipency, using the Schauta technique. In corporal cancer the author uses the vaginal method, except where the case is advanced and one might

cause mutilation and soiling of the field with cancer tissue.

If extirpation is done by means of the cautery, the cautery knife should be cold when brought in contact with the tissues and then heated, to prevent bleeding by a too rapid division of the vessels.

If the radical abdominal operation is advisable, the author advises the Wertheim method, i.e., removal of the uterus, adnexa, extensive removal of the parametria, accessible pelvic and iliac glands, and the upper part of the vagina, particularly if the cancer is in the vaginal part of the cervix.

Intrapelvic and intra-abdominal cancer is not so readily diagnosed as uterine cancer. In cancer of the ovary, if the peritoneal covering has not been broken through, the prognosis is good. He advises the early operation of all abdominal and pelvic tumors. Primary cancer of the vagina is usually seen too late to make possible a cure.

The author emphasizes the necessity of keeping all patients under observation for a number of years, in order to operate upon recurrences at the earliest possible moment.

Palliative treatment in the form of galvano-cauterization has given the best results, employing a high degree of heat. It must be remembered that some cases are even beyond the stage where cauterization is useful. In some cases X-ray and radium have given relief.

C. A. BOWERS.

Longworth, M. J.: Some Contra-Indications for Certain Gynecological Operations. *Ohio St. M. J.*, 1918, xiv, 98.

In no field of surgery are unnecessary operations performed so frequently as in gynecology. One of the most serious and common mistakes is the performance of abdominal section in the active stage of a pelvic infective process, such as peritonitis, cellulitis, salpingitis and ovaritis. In these laparotomy is contra-indicated. In many cases where vaginal drainage is resorted to, a complete cure results.

Oophorectomy should not be performed for intractable metritis, endometritis, menorrhagia, dysmenorrhea or any other condition where it is desirable to establish the menopause. In these cases hysterectomy should be performed, leaving the ovaries unless they are diseased. The ovaries have an important internal secretion concerned with the maintenance of health and the equilibrium of the nervous system; the uterus has no such secretion.

A vast majority of authorities contend that hysterectomy is contra-indicated in small blood tumors of the uterus unaccompanied by hemorrhage or other serious symptoms. The patient, however, should be kept under observation for complications.

Trachelorrhaphy is contra-indicated in cases that are not producing symptoms. It is also contra-indicated in hypertrophied diseased cervixes; in these cases amputation of the cervix is the proper operation.

Secondary operation for the repair of the cervix or perineum should not be attempted until six to twelve months after labor. Failure of the primary repair is usually due to infection and the bacteria causing it may remain virulent for many months. An operation performed too soon might be a failure, due to a revival of the infection. In fact, the bacteria may be disseminated and cause death from septicæmia.

The use of the curette is contra-indicated in acute endometritis, gonorrhœal or otherwise, as the danger of the extension upward is increased. Especially is this so in gonorrhœa, which extends along the mucous membranes from the vagina to and through the cervix, along the mucous membrane of the uterus, and thence through the fallopian tubes to the peritoneum and ovaries.

A common mistake is to curette cases of extra-uterine pregnancy in the belief that they are incomplete uterine abortions.

EDWARD L. CORNELL.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Wynne, H. M. N.: *Interstitial Pregnancy*. *Bull. Johns Hopkins Hosp.*, 1918, xxix, 29.

Wynne considers ectopic pregnancy in the interstitial portion of the fallopian tube to be of especial interest on account of its infrequency and from the standpoint of diagnosis. He reviews the literature of this interesting and rare condition and discusses the diagnosis, cause, treatment and prognosis. He then reports a case that occurred in the gynecological service of the Johns Hopkins Hospital.

The patient was a white woman, twenty-four years old, married five years, who had had a normal labor and puerperium three years before and had had no miscarriages. Six years before admission she had had an attack of abdominal pain diagnosed as appendicitis, but had not been operated upon for it. The past history was otherwise negative. Her last regular period began August 1, 1914; since that time amenorrhea had persisted. She considered herself pregnant.

On November 29, 1914, she fell down stairs, and a half-hour later while attending to her household duties she was seized with violent general abdominal pain. The pain continued very severe all the afternoon and four hours later she vomited. She noticed that her abdomen was becoming larger and was very tender. A physician was called and brought her to the hospital with a diagnosis of an acute ruptured appendix. She was admitted to the hospital that night.

Physical examination showed her to be well-nourished and well-developed. She was in great pain. The skin and mucous membranes were extremely pale; the skin was cold and covered with sweat; the pulse 160, small and weak; rectal temperature was 99. The abdomen was distended, tense, very tender, and movable dullness was demonstrable. The diagnosis was ruptured extra-uterine pregnancy.

When the abdomen was opened through a midline incision below the umbilicus a large amount of fluid, blood and fresh clots escaped, estimated at two liters. A nodule measuring 2.5 cm. in diameter was seen in the right uterine cornu, on the posterior surface of which there was a perforation 1 cm. in diameter, through which placental tissue bulged. There was no active bleeding. The attachment of the round ligament was anterior to the gestation sac. A few fine adhesions were found about the right adnexa; the left tube and ovary were normal.

There is a detailed report appended of the gross and microscopical study of the specimen removed, together with several microphotographs.

GEORGE E. BEILBY.

Rongy, A. J.: *The Treatment of Ectopic Gestation Based on a Study of 100 Cases, with a Report of 12 Cases of Repeated Ectopic Pregnancies*. *Am. J. Obst.*, N. Y., 1918, lxxvii, 36.

The author's report is based on a series of cases of ectopic pregnancy during the past eight years. Previous to 1911 his cases were treated without surgical interference until the patients had recovered from shock; since that time the majority of them have been operated upon as soon as possible after their admission to the hospital. A comparative study of the two series of cases shows very little difference in final results. In both series the morbidity and mortality were about the same, unless it is assumed that some of the patients who were operated upon at once would have died if left without operation. Rongy believes it is not yet possible to state which is the better plan of treatment. On the other hand, as long as it is impossible to foretell how soon hæmorrhage may prove fatal in any given case, he thinks it proper to operate without delay in the greatest number of cases.

An analysis of the cases shows that nearly 90 per cent of them were not recognized until rupture had taken place. In 40 the diagnosis was that of incomplete abortion. Nine of these had been curetted by the family physician once, and two curetted twice. Four patients died, one on the third day from uræmia, two from sepsis, and one did not rally from the shock. In one of the two patients lost through sepsis, an attempt at criminal abortion had been made.

The patients ranged in age from nineteen to forty years; 19 cases between twenty and twenty-five, 27 between twenty-five and thirty, 28 between thirty and thirty-five, 21 between thirty-five and forty, and 4 cases of forty years or older. Seventeen of the patients had never been pregnant, 22 were para-I, 16 para-VII, 2 para-VIII and 1 para-IX. In 1 case the previous pregnancy had been six months earlier; in 12 cases the previous pregnancies had occurred one year before; in 7 cases three years; in 4 cases four years; in 7 cases five years; in 3 cases six years; in 1 case each seven, eight and ten years respectively; in 4 cases twelve years, in 2 cases each thirteen and sixteen years.

The most striking feature of the series is that of these cases repeated ectopic pregnancies formed an unusually large percentage. — CAROLY CYLERTON.

McPherson, R.: *The Conservative Treatment of Eclampsia*. *Am. J. Obst.*, N. Y., 1918, lxxvii, 18.

McPherson claims that the mortality statistics in eclampsia treated by radical methods run as high as 30 per cent for the mother and 50 per cent for the child. He then compares these figures with

those of the Sloane Maternity Hospital report of the last 13,774 cases, where the eclampsia mortality is reduced to 14.5 per cent for the mother and where the treatment has been conservative.

The routine Sloane treatment is then outlined. The eclamptic patient is isolated in a darkened room, given one-quarter of a grain of morphine sulphate, 2 ounces of castor oil following gastric lavage, and a colonic irrigation of 5 gallons of a 5 per cent glucose solution. Phlebotomy is done if the blood-pressure is over 175 systolic until this is reduced to 130. One-quarter of a grain of morphine sulphate is then administered every hour until respirations drop to eight per minute. By the time the convulsions have ceased the patients are in labor and are delivered normally or by easy low forceps.

The series here reported consisted of 53 true convulsive toxæmias. Of these, 53 patients were treated as outlined and of the 53, five mothers did not survive. McPherson strongly urges a return to this conservative attitude on the part of obstetricians of surgical tendencies. He holds that abdominal cesarean section has absolutely no place in the treatment of convulsive toxæmia of pregnancy except in the cases where the eclampsia is accompanied by a deformed pelvis or some severe disproportion between mother and child.

CAREY CULBERTSON.

Davis, J. E.: Causes of Abortion. *J. Mich. St. M. Soc.*, 1918, xvii, 2.

According to Davis, the causes of abortion may be classified as follows:

1. Criminal provocation, direct or indirect.
2. Maternal, such as constitutional disease, pelvic disorders, affections of the nervous system, etc.
3. Paternal, such as certain constitutional diseases, chief of which is syphilis, and old age.
4. Fetal, such as death of the fetus and diseases of the placenta.

It is generally supposed that 50 per cent of abortions are criminally provoked. Titus found 82 per cent of a series of criminal abortions at the Johns Hopkins Clinic were incomplete, and 78 per cent of this same series were infected, streptococcus infections occurring in 34.3 per cent of these cases.

Abortions during the first few weeks of pregnancy are expelled *en bloc*, while after this period expulsion is in two parts. The inefficiency or lack of preparation of the uterine muscle is thought by the author to cause a retention of parts or all of the membranes and placenta. Retention of secundines is much more common after abortion than after full time labor. Whitehead estimated that 60 per cent of all married women have abortions. Bacon says that from 20 to 25 per cent of all pregnancies terminate in abortion.

Under the maternal, paternal and fetal causes of abortion, syphilis is the most frequent cause. In 637 syphilitic women there were 35 per cent of abortions.

Decidual endometritis is a cause of abortion in 52 per cent of infected and 68 per cent of uninfected cases, while retroposition is a cause in 30 per cent of the cases.

Lacerations of the cervix and pelvic floor account for 14 per cent of all abortions.

Cancer and intra-uterine tumors are frequent causes.

Poisons in the maternal blood from fevers such as smallpox, scarlet fever, typhoid and the like, are frequent causes of abortion, as are affections of the nervous system, as chorea, epilepsy and shock.

Epidemic abortions caused by the bacillus abortus of Bang and streptococci have been reported.

The causes referable to the fetus include all the many diseases of the placenta, death of the fetus, and syphilis.

The paternal causes include mainly syphilis, gonorrhœa, albuminuria, lead poisoning, and old age.

In conclusion, the author urges every physician to vividly portray to his patient the consequential pathology of abortion. HARVEY B. MATTHEWS.

Coyle, E. G.: Toxæmias of Pregnancy. *J. Kansas M. Soc.*, 1918, xviii, 63.

Eclampsia occurs about once in 300 cases of pregnancy, according to the author, most frequently during labor, next in pregnancy, and least frequently during the puerperium. It is still a disputed question whether the toxins causing eclampsia are derived from the syncytium of the placenta, or from fetal metabolism; most opinions lean toward the latter. It is probable that the toxæmia of the first half of pregnancy is due to syncytial growth and is not affected by eliminative treatment, while such treatment favorably affects the toxæmia of the latter half of pregnancy, the symptoms being due to fetal metabolism and disappearing with the death of the fetus.

In hydatiform mole, associated with an enormous overgrowth of syncytium, eclampsia is extremely rare. The manifestations are usually those of parenchymatous nephritis, but albuminuria may not appear before one or two eclamptic convulsions take place. Here the albuminuria may be due to the muscular exertion during the convulsion. The author cites three of the reported five cases which illustrate that point. The other cases are typical. He urges careful examination of the urine, especially in the latter part of pregnancy, when proper treatment will abort eclampsia in many cases.

L. R. GOLDSMITH.

Davis, J. E.: Retained Secundines: a Study of Etiological Factors. *Am. J. Obs. N. Y.*, 1918, lxxvii, 192.

The materials for this study were obtained from a review of the literature listed in the entire series of the *Index Medicus* from 1878 to 1917, including available theses, books or other contributions referred to in accompanying bibliographies. In

addition to this a careful pathological study was made of seventy sections obtained from 474 routine gynecological cases, representing a classified part of the total material examined by the Department of Pathology in the University of Michigan.

The author goes into the most recent knowledge of the physiological and microscopical tissue changes during early pregnancy, and then takes up the inherent degenerative changes occurring either in the embryo or maternal parts. Malpositions of the uterus are also considered as a possible factor in the retention of secundines in abortion. The paper opens up widely the entire subject of complete or incomplete abortion and the discussion is chiefly directed towards early placentation and its relation to the corresponding changes in the endometrium.

This leads, in turn, to a consideration of the question of criminal abortion and the influence of syphilis in early pregnancy. The author says:

"During pregnancy there is an immediate and easy gaping of the vessels in the proximity of the embryo for the purposeful 'give and take' of essential products. The perfection of this mechanism and its normal operation is the crux of the entire question of abortion and whether it is complete or incomplete depends upon the nature of the intercepting pathological factors.

"It is to be specifically emphasized that the principles involved, from whatever cause, may be essentially the same in producing the factors which determine improper enzymic production and interaction, or produce abnormal metabolic changes which in turn lead to death of the fetus and partial expulsion of the secundines." CAREY CULBERTSON.

McIntosh, G. J.: Premature Separation of the Placenta with Concealed Hæmorrhage. *J. Lancet*, 1918, xxxviii, 14.

McIntosh states that premature separation of the placenta in various degrees is much more common than is generally believed. It occurs oftenest at the beginning of full term labor or in the last ten weeks of pregnancy. The cause may be twofold; either traumatism, or disease of the placenta or decidua. It is probable that the traumatic cases are associated with and exaggerated by pathologic conditions of the uterus or other systemic diseases.

Premature separation of the placenta is accompanied by hæmorrhage, which may become evident or be concealed even up to the time of a fatal termination.

The severity of the symptoms depends upon the amount of hæmorrhage. In traumatic cases the symptoms may not manifest themselves for days. Generally there is pain of varying degree at the placental site, first of a tearing character, later a dull ache, with possibly colic-like intervals. Next come symptoms of acute anemia, and later shock, with its characteristic manifestations.

If the hæmorrhage is concealed, a dark bloody serum is expressed by the blood-clots and passes out

from the uterus. The abdomen is larger than normal, hard, and there is difficulty in outlining the fetus. The mother feels no fetal movements, and the fetal heart sounds can not be heard by auscultation. Labor is usually very slow, and in many cases terminates fatally. If the mother is saved, the child is almost invariably lost. This condition is to be differentiated from rupture of the uterus, extra-uterine pregnancy, as well as placenta prævia; more rarely from other surgical conditions as rupture of another abdominal viscus.

The prognosis depends upon the early treatment. The mortality in complete separation of the placenta is 50 per cent for the mother and 95 per cent for the babies. In incomplete cases it is less. As to treatment, no hard and fast rule can be laid down. Conditions have to be met as they arise with a view to saving the mother, since the chances of a viable child are so very poor. Cæsarean section may be performed when the cervix is tightly closed, if there is not much shock. Reports of two cases are given.

L. R. GOLDSMITH

Labhardt, A.: Dangers and Treatment of Placenta Prævia (Gefahren und Therapie der Placenta prævia). *Cor.-Bl. f. schwis. Ärzte*, 1917, xlvii, 1339.

The author's statistics cover the period from 1906 to 1915. In 16,506 births he observed 123 cases of placenta prævia. The maternal mortality was 10 per cent; fetal absolute mortality 62 per cent, and relative mortality 53 per cent.

The chief dangers of placenta prævia arise from liability to hæmorrhage, increased chances of infection, and possibility of gaseous emboli.

The author thinks that since the cæsarean operation in the hands of expert operators reduces the fetal mortality almost to zero, and since with asepsis assured, the mortality of the operation itself is reduced to zero, this operative method would appear to be the most rational recourse to save the child in the case of placenta prævia. It is vital that there should be no infection when cæsarean section is contemplated; and it should be done in the early states of labor, before the lower portion of the uterus is distended.

W. A. BRENNAN.

Norris, C. C., and Landis, H. R. M.: Pregnancy and Pulmonary Tuberculosis; with a Report of 103 Cases. *J. Am. M. Ass.*, 1918, lxx, 361.

The combination of pregnancy and pulmonary tuberculosis is a frequent one. Pulmonary tuberculosis exerts little or no influence against conception. It exerts but little influence on the course of pregnancy and, except in the advanced stages, exerts little or no influence toward causing abortion, miscarriage or premature labor.

About 20 per cent of cases of mild, quiescent pulmonary tuberculosis and 70 per cent of more advanced cases exhibit exacerbations during pregnancy or the puerperium. Marriage is worse for tuberculous women than for tuberculous men, owing to the dangers incident to pregnancy.

Unless the pulmonary lesions have been quiescent for a moderately prolonged period, tuberculous women should not marry. Tuberculous women should not become pregnant unless the disease is in the first stage, and has been quiescent for a minimum period of two years.

It is as yet impossible to determine with certainty which patients will bear the added strain of pregnancy well and which badly. Patients must be individualized. Moderately extensive lesions, recent activity, the development of secondary lesions, especially laryngeal involvement, loss of weight, fever, hemorrhage, sweats, lack of vigor, and inability to obtain proper treatment are ill omens, whereas the reverse are more favorable.

Prior to the fifth month of pregnancy, the uterus should be emptied if the disease manifests evidence of becoming active, or if the lesions are extensive or laryngeal involvement occurs. Curettage during the first six or eight weeks and, in the latter cases, vaginal hysterectomy, are, as a rule, preferable methods. Interruption of pregnancy does not insure an amelioration of the pulmonary condition, but does definitely improve the prognosis. About 65 to 70 per cent of patients, prior to the fifth month of pregnancy, will be definitely improved by emptying the uterus as soon as acute symptoms arise, provided proper after-treatment is carried out. Late intervention has given less satisfactory results. Sterilization is rarely justifiable.

After the fifth month of pregnancy, it is generally advisable to treat these patients expectantly. Labor should be made as easy as possible. For this end, induction of premature labor two weeks before term is often advisable, rarely, if ever, should they be allowed to go beyond term. At labor, forceps or version is usually indicated.

Infants should not be nursed by tuberculous mothers and should be especially guarded from infection.

Hygiene and dietary treatment should be employed at all times. These patients should be kept under close observation and should be examined by a competent internist at regular and frequent intervals.

In the great majority of cases the tuberculosis precedes the pregnancy. Even in those cases in which the symptoms are first observed during pregnancy, infection has generally occurred prior to conception, and an exacerbation during pregnancy has directed attention to the pulmonary condition.

All pregnant women giving a history at all suggestive of pulmonary tuberculosis should be subjected to a thorough examination by a competent internist at the earliest possible date. Only in this way can the proper treatment be instigated at the time when it is most valuable.

It is doubly important that tuberculous pregnant women shall be given the same care as the non-pregnant person as far as rest, hygiene, diet, etc., are concerned.

EDWARD L. CORNELL

Walsh, J.: *Pregnancy in Cases of Tuberculosis of the Lungs.* *Am. J. Obst.* N. Y., 1915, LXV, 2, 22.

Walsh has made a study of 38 women in all stages of pulmonary tuberculosis with respect to child-bearing and its influence on their condition. To these patients after recognition of their disease 50 children were born. In 27 the disease was recognized and treated before the first pregnancy, in 11 the disease was first recognized during pregnancy. Out of the first group 3 died, and of the second there were 3 deaths. Of the first group, 25 are apparently as well as before pregnancy, 3 having had three children and 6 two children. The pregnancies occurred one to twelve years after treatment, the average being four years. Of the second group, 2 patients are still under treatment and the remaining 6 in good health after periods of time varying from three months to thirteen years. The treatment referred to in these cases was carried out under sanatorium management.

Walsh's conclusions are:

1. Active cases of tuberculosis should be advised against marriage; quiescent cases especially after treatment and education bear the duties of marriage sufficiently successfully that if they wish to marry they may be allowed to do so.

2. Quiescent cases becoming pregnant, if put through a rigid régime, may be expected to come through the pregnancy with but little, if any, advance of the tuberculosis.

3. Active cases becoming pregnant run definite risk, yet the operations for abortion, especially those associated with sterilization, have a mortality making the continuation of the pregnancy more desirable.

CARLY CULBERTSON

Marvel, E.: *Should the Uterus Be Removed When It Becomes Imperative to Interrupt Pregnancy?*

Am. J. Obst. N. Y., 1915, LXV, 1, 86.

Marvel in a short paper propounds the rather novel thesis that hysterectomy should accompany or constitute the method of interruption of pregnancy when this becomes necessary because of maternal complications. His argument is summed up practically in this paragraph:

"Hysterectomy not only promises immediate relief, but it also provides protection against the recurrence of child-bearing. Hysterectomy is performed with less risk to the patient than other surgical methods ordinarily employed to terminate pregnancy. The removal of the uterus renders conception impossible. Hysterectomy can be done easily and quickly, with little loss of blood during the operation, and definitely provides against loss of blood thereafter. Hysterectomy is a definite surgical procedure, and secures a more satisfactory result than other operative measures."

The cessation of menstruation, consequent upon hysterectomy, is advanced as an especially desirable feature in valvular heart lesions and in pulmonary tuberculosis.

CARLY CULBERTSON

LABOR AND ITS COMPLICATIONS

De Gaudino, M. F.: Uterine Crying (Vagido uterine). *Rev. Argent. de obst. y ginec.*, 1917, 1, 394.

Intra-uterine fetal crying was first described by Felipe List in 1650. Bucura collected 50 cases in literature up to 1904. Many authors deny the existence of such a phenomenon because they have never known nor heard of such a case.

The conditions, as gathered from the published cases, under which intra-uterine crying may occur are: (1) rupture of the bag of water; (2) entrance of air into the uterus; (3) excitation of the fetal body; (4) compression of the cord. The necessary factors for production of intra-uterine fetal respiration are interruption of the placental circulation and excitation of the skin by sensory stimulus. The first is produced by section or compression of the cord.

Intra-uterine crying is nothing else than the premature presence of extra-uterine conditions. By any interruption or disturbance of the placental circulation the fetal blood becomes venous and excites the respiratory center, and the air which is in the uterine cavity is inspired. If the child expires the escaping air, a sound is produced when the vocal cords are tense.

All the necessary conditions may be found in labors with extensive manipulations. In the 50 reported cases there were 11 forceps cases, 15 versions, and in all cases some manipulation which permitted air to enter the uterus. Thirty-four of the infants expired immediately after birth; in 10 the condition was not stated; 5 others were asphyxiated but were revived. There was only 1 death.

The author relates one case. This was in twin labor and the intra-uterine crying was distinctly heard after the passage of the first fetus. The second fetus was extracted by forceps and was in good condition. W. A. BRENNAN.

Potter, I. W.: Version, with a Report of 200 Additional Cases Since September, 1916. *Am. J. Obst.*, N. Y., 1918, lxxvii, 215.

The author bases his opinions on his own experience with over 6,000 personally conducted confinements, regardless of textbook methods of practice or procedures advocated by many teachers of obstetrics. These opinions are:

1. Version lessens the shock of labor.
2. It lessens the dangers due to pressure from and on the head of the child.
3. Version should never be undertaken until the os is fully dilated or easily dilatable.
4. The majority of occipitoposterior positions are best treated by version.
5. Version is as readily performed in the primipara as in the multipara.
6. The fetal mortality of version should not be as great as that of prolonged labor and instrumental delivery.
7. Injuries to the child's head are reduced by a properly performed version.

8. Face presentations are better treated by version.

9. Prolapse of the cord when the cervix is dilated or dilatable, and the cord is still pulsating, is best treated by version.

10. Placenta prævia in multipara with cervix dilated or dilatable is best treated by version.

11. A moderately contracted pelvis, when the child is small, is best treated by version.

CAREY CULBERTSON.

Wood, R. L.: Labor Complicated by Dermoid Cyst. *Hosp. Bull. Dept. Public Charities, N. Y.*, 1918, 1, 90.

The patient was a negress, obstetrically normal, who had borne one child normally. Dilatation was slow; eighteen hours elapsed before the membranes ruptured spontaneously. Forceps in a mid-plane were applied under ethyl chloride, then ether anesthesia because of the exhaustion of the mother. Delivery was carried out with moderate ease; one suture was placed for a mucous tear.

At the first traction a large body was expelled from the rectum; it was not pedunculated, and no bleeding or symptoms of collapse followed its passage. The laboratory reports showed it to be a true dermoid cyst, containing much cheesy material in which hair was present, and an occasional area of bone formation. It was certain that it was not a secondary impregnation with fetal death.

Dermoids may exist in the rectum, at the level of the sacral promontory, loosely attached and folded upon themselves. The whole mass was well-nourished, and the surface veins were distended. There were no signs of a pedicle which had undergone torsion. It had a "living" and fresh appearance.

MISCELLANEOUS

Bartholomew, R. A.: Syphilis as a Cause of Stillbirths: Analysis of 48 Stillbirths Occurring in 1,500 Obstetric Cases at the University of Michigan Maternity Hospital. *J. Am. M. Ass.*, 1918, lxx, 289.

There is need for the adoption of a uniform definition of stillbirth and of compulsory reporting of stillbirths, in order that statistics on this important cause of infant mortality may be improved.

Syphilis is the causative factor in at least one-third of the stillbirths from the time of viability to full term, and a Wassermann reaction is strongly indicated in cases in which there have been suggestive clinical symptoms, unexplained abortions, or premature labors with macerated babies.

A combination of mercury and salvarsan is more effective in assuring the birth of a healthy infant than salvarsan alone.

Important confirmative evidence in the diagnosis of syphilis can be obtained from microscopic examination of the placenta, or, in case of stillbirth, from examination of the fetal liver by the Levaditi method.

More efficient and practical training in obstetrics and safer surroundings for the patient during confinement will prevent some of the stillbirths resulting from other complications of pregnancy and obstetric emergencies. However, there will always remain a considerable number of stillbirths from unavoidable causes. EDWARD L. CORNELL.

Gardner, J.: Care of the Perineum During the Second and Third Stages of Labor. *Ohio St. M. J.*, 1918, xiv, 85.

A great deal can be done indirectly for the care of the perineum by directing the forces concerned in the expulsion of the child and in the correction of the malpositions. The consensus of opinion may be summed up in the following statements: (1) Avoid a too rapid delivery by allowing the fascia and muscles time to stretch. (2) Allow the head to pass through only in its smallest diameters. (3) Allow favorable delivery of the shoulders.

The greatest point in saving the perineum is to be so master of the situation that delivery of the head will be accomplished between pains. To secure this the patient should be sufficiently anesthetized to prolong, if necessary, the interval between these pains. The obstetrician must be free from any further responsibilities at this time, other than the delivery of the head and shoulders. The neglect to observe this is the one grievous fault. Undue retention of the head in a powerful levator ani or a rigid perineum may so compress the child's head that tearing of the meningeal vessels may occur.

Luschka states that fibers arise on the descending ramus of the pubis, called the pubococcygeus, and are inserted behind the anus in a tendon in common with the fibers of the other side, sending no fibers to the vagina or rectum and only a few short, unimportant fibers to the perineum. It is represented as horse-shoe shaped, the anterior opening for the passage of the rectum and vagina and urethra.

From the author's dissections of female pelvis, he finds there are fibers of the levator ani which arise from the posterior surface of the body of the pubis as well as the descending ramus and that they send fibers to the vagina, perineum and rectum. Approaching the levator ani from below, it is seen to be reinforced by fibers running from before backward, having their origin about the middle of the descending ramus of the pubis and inserted into the anterior lateral portion of the anus. These fibers do not unite in the perineum in front of the anus. The fibers diverging thus from the anus form a "V," whose apex is broad and is filled in by the anterior portion of the sphincter ani. The fibers forming the sides of the "V" are the fibers frequently pointed out as the ones so important to expose and unite in repair of the perineum.

As the largest diameter of the head is passing through the vulvar outlet or end of the canal, the muscles transversus perinei superficial and deep, the sphincter vagina and the fibers of the above-mentioned "V" of the levator ani are stretched.

It is just before this moment that the advisability of performing episiotomy is thought of. This is a very important time for the perineum and it often rests with the obstetrician to turn defeat into victory.

EDWARD L. CORNELL.

Sanderson-Wells, T. H.: A Case of Puerperal Septicemia Successfully Treated with Intravenous Injections of Collosol Argentum. *Lancet, Lond.*, 1918, cxciv, 258.

The patient, aged 20, was delivered of a live child by forceps one week previous; the child weighed 8½ pounds at birth. The delivery was quite easy. There was a moderate-sized perineal tear which was repaired. The perineum became septic and the stitches were removed. When admitted to a hospital a week later her temperature was 104° F., pulse 128, respiration 30. There was a thin sanguinous discharge from the vagina, a small ulcer over the perineum, and slight abdominal tenderness. She was given a purgative and the bowel washed out. She was placed in the Fowler position for seven hours daily and given hot vaginal douches of lysol; also a mixture containing hexamine, acid sodium phosphate and bromide, and a dose of polyvalent serum, which was continued every day until a vaccine had been made. The next morning her temperature was normal, but in the evening it rose to 105° and she had a rigor.

On the following day she was given an anæsthetic. The perineum and vagina were well swabbed out with iodine, the uterus curetted with a flushing curette and packed with gauze soaked in collosol argentum. Blood taken from the median cephalic vein grew a pure culture of the streptococcus, from which a vaccine was made.

The patient was losing ground, so she was given 20 ccm. of collosol argentum into a vein. This was followed by a profound rigor and a certain amount of collapse, but the next day her general condition was much improved, the temperature had fallen to normal and the pulse in the morning was counted at 80. The temperature rose, however, again at night, but continued at a lower range. The dose of collosol argentum, 20 ccm., was repeated four times at intervals of a couple of days, and was followed on each occasion by a profound rigor. She developed a thrombosis in the external saphenous in the middle of the right calf, and her pulse returned to between 120 and 130.

Her condition again became serious and a blood culture gave a growth of pure streptococcus. A further injection of 20 ccm. of collosol argentum was given, followed, as before, by a severe rigor; the temperature fell and the next day remained at normal.

EDWARD L. CORNELL.

Voorhes, J. D.: Can the Frequency of Some Obstetrical Operations Be Diminished? *Am. J. Obst. N. Y.*, 1918, lxxvii, 1.

It is believed by the author that many uncertain obstetrical operations can be avoided by ordinary

measures during pregnancy and labor and he proceeds to elucidate this belief in a somewhat reminiscent paper covering his experiences of the past twenty years. After reviewing former obstetrical methods and ideas, of historical value only, he produces statistics covering his work of recent years that are of definite interest. Thus he notes a decrease in eclampsia at the Sloane Hospital during recent years. From Jan. 1, 1901 to Dec. 31, 1905, there occurred 113 cases in 7,145 deliveries, 1.5 per cent. From Jan. 1, 1911 to Dec. 31, 1915, but 74 cases occurred in 9,224 deliveries, 0.8 per cent.

He favors turning breech presentations by external manipulations before labor and believes that he has so converted 75 per cent of his breech cases. Brow, face, and persisting occipitoposterior positions are likewise righted without waiting for labor to intervene.

He attempts to prevent large babies by dieting the mother and by early induction of labor if the child appears to be overgrowing.

The indication for the use of pituitrin has been narrowed down in Voorhees' experience to simple inertia without obstruction. There are four cardinal conditions before employing it: (1) the cervix must be completely dilated and effaced; (2) the membranes must be ruptured; (3) the presentation must be normal; (4) there must be a proper relation between the foetal head and the maternal pelvis throughout.

The author prefers nitrous oxide gas or gas with oxygen as his analgesic in labor but finds even this method far from being a perfect anesthetic. Two drawbacks to its use are: (1) the frequent great difficulty in controlling the advance of the head over the perineum, requiring a change to chloroform or ether; (2) an increased tendency to postpartum hemorrhage.

He appears to be enthusiastic over induction of labor and finds it preferable to have a primipara delivered a week or two ahead of time. Castor oil and quinine, failing which the de Ribes bag, constitute a method of procedure.

From 1901 to 1905 labor was induced 284 times in 7,145 cases, 3.9 per cent; from 1911 to 1915 in 9,224 cases, 302 labors were induced, 3.3 per cent.

During the first period low forceps were employed 538 times, 7 per cent; during the second period, 380 times, 4 per cent. Medium forceps operations increased from 176 to 440, or 2 per cent to 4.5 per cent. High forceps operations likewise increased from 81 to 138, or 2 per cent to 4.5 per cent. Versions diminished from 190 or 4 per cent to 37.2, or 3 per cent. Craniotomies diminished from 33 to 18, or 0.3 per cent to 0.2 per cent. The last symphysiotomy was performed in 1902, the last pubiotomy in 1908.

From 1901 to 1905 cesarean section was done 38 times, 0.53 per cent; from 1911 to 1915 there were 133 cases, 67 primary, 70 secondary, or 1.65 per cent.

Voorhees' conclusions are that high forceps operations are diminishing in frequency, that elective versions, symphysiotomies and pubiotomies are more or less obsolete and that craniotomies are performed as a last resort on dead, injured or non-viable babies. Induction of labor and cesarean sections are frequent in recent years and are safe and sane operations under recognized conditions, disregarding the radicalism of men who perform abdominal section merely as an easy way out of any obstetrical difficulty.

The author's views are, on the whole, optimistic, in contradistinction to those writers who bewail obstetrics as it is practiced in general. While acknowledging that there is too much indifference, ignorance, and bungling work among the rank and file of the medical profession in the practice of obstetrics, he formulates the four changes which are bringing about great progress. These are:

1. Women appreciate that pregnancy and labor are often far from physiological processes and seek advice early.

2. Medical students and practitioners, even midwives, are better trained and know more frequently what to do in an emergency. They also know when they have reached the limit of their knowledge and resources and when to call in skilled assistance.

3. More women are delivered in hospitals, where every weapon is at hand to combat any expected or unexpected complication.

4. More physicians specialize in obstetrics.

CAREY CULBERTSON.

GENITO-URINARY SURGERY

KIDNEY AND URETER

Schmidt, L. E.: Focal Infection of the Genito-Urinary Tract. *Chicago M. Recorder*, 1918, xl, 33.

The author traces many cases of chronic persistent metastatic infections to old genito-urinary disease. He believes that the gonococcus does not remain longer than two years in a viable state in the genito-urinary tract. But the ravages of the gonococcus leave a good soil in which other microorganisms thrive which are indigenous to that tract. Schmidt lays stress on the seminal vesicles and prostate as harboring latent chronic infection and believes that generally when the prostate is infected, the vesicles are also.

The author emphasizes the fact that no genito-urinary disease should be considered cured by the urologist as long as pus can be found in the urethra or its adnexa. He believes this tract is too often overlooked as a source of infections by the general profession, and thinks that the urologist should more often be taken into consideration in the study of cases in which a hidden focus of infection may be found.

A. C. STOKES.

Green, R. E.: Tumors of the Kidneys. *J. Iowa St. M. Soc.*, 1913, viii, 41.

According to Green, renal tumors are encountered about one to five times in a thousand cases. They are usually unilateral and are most frequently found before the tenth or after the fortieth years. Diagnosis is based on the symptoms of hæmaturia, pain, and tumor. Of these three signs he considers hæmaturia by far the most important.

He reports the following case:

A woman thirty-seven years old, a school teacher and unmarried, entered the hospital because of general weakness. She gave a history of severe attacks of hæmaturia over a period of two years. Blood was found in her urine. There was some backache and some general so-called "rheumatic pains." There had been no great loss of weight. There was no cachexia. The physical examination did not reveal any gross abnormality. Acid-fast organisms were found in the urine of the first examination, but repeated examinations of catheterized specimens failed to show others. The right kidney was movable, easily palpable, and not enlarged. The left kidney could not at this time be palpated.

After a lapse of several weeks, she returned again, complaining of more severe pains, and tender areas were discovered on the shaft of the right humerus, and near the head of the left femur. Radiographs of these areas showed the presence of bone tumors. She also complained of some blurring in

vision of the left eye, and the ophthalmoscopic examination disclosed a pathological condition of the retina, but nothing more. A radiograph revealed at this time an enlarged left kidney which could now be palpated with difficulty. Later there was metastasis in the flat bones.

Due to the findings of hæmaturia, with bony and probably retinal metastasis, a diagnosis of renal tumor, probably hypernephroma, was made. The patient lived four months longer, but no autopsy was obtained.

H. W. E. WALTHER.

Menetrier, P.: Lithiasis and Kidney Cancer (Lithiase et cancer de rein). *Bull. Acad. de méd., Par.*, 1918, lxxix, 65.

The author reports the case of a woman forty-nine years old with chronic disease of the right kidney lasting four or five years, and terminating in a large tumor in the flank and cachexia with fever, complicated in the final stage with severe pulmonary disturbances which caused the patient's death. Autopsy showed that the symptoms were the consequence of a cancer of the right kidney originating from a calculus pyonephrosis with metastases to the lungs and liver.

The author thinks that the case shows that the cancer originated from a chronically inflamed pelvic mucous membrane. There is a causal relationship between the pyelitis which accompanies stones and cancer, and the author concludes in this case that the cancer developed from the chronic pyelitis.

W. A. BRENNAN.

Brausch, W. F.: Lithiasis with Bilateral Renal Involvement. *Boston M. & S. J.*, 1918, lxxviii, 202.

Brausch discusses the whole question of lithiasis with bilateral renal involvement, based on a study of some ninety cases of this sort. Of these, sixty-two had been operated upon for bilateral nephrolithiasis with no immediate mortality. In the Mayo Clinic, 12.3 per cent of the cases of renal stone operated upon between January 1, 1910, and October 1, 1917, were bilateral.

Many of these cases complained of pain only on one side; some had no pain at all. The painful kidney was usually the better of the two. In a number of cases the low function of the kidneys was considered to be a warning against operative interference, unless operation was made imperative by reason of pain, hæmorrhage or toxic absorption. Brausch observed that frequently the renal function improved after removal of the stone.

Estimation of the relative value of the two kidneys is based upon the radiograph, cystoscopic examination and the phthalein test applied to the

kidneys separately. The kidney with acute complications should be operated upon first; without acute complications the kidney with the better function should be operated upon first; occasionally simultaneous bilateral operation is advisable.

Stone recurred in 20 per cent of the bilateral cases, as against 10 per cent of unilateral cases. Braasch considers also what to do in case of pyelonephritis, pyonephrosis, hydronephrosis, or tumor in the opposite kidney, stone in a single kidney, stone in a horseshoe or fused kidney. His conclusions are logical and based on good evidence. G. G. SMITH.

Thompson, A. R.: *Hematuria; a Clinical Lecture.*
Guy's Hosp Gaz., 1917, xxv, 450.

The author presents three interesting cases of hematuria and lays down some rules for guidance.

1. Hematuria is not a disease, but a symptom, indicating in a large number of cases grave disease of the urinary apparatus.

2. Hematuria is not a common symptom of vesical calculus.

3. Hematuria should be investigated with a cystoscope during an attack of hemorrhage; the origin of the blood can thus be seen and localized.

4. Hematuria is rarely fatal in itself. Its danger lies in the disease which causes it.

The first case was a man 52 years old, who was admitted to the hospital with a history of pain in passing water and hematuria of several months' duration.

Examination showed extreme anemia, persistent hemorrhage, and the absence of any localizing renal signs favored the theory that it might be a growth of the bladder. Roentgenogram and X-ray examination gave negative results.

Cystoscopy located blood coming away from the left ureter; this caused suspicion of a new-growth in the kidney. As the patient was very anemic, the author decided to operate on the left kidney to discover the trouble.

Incision disclosed an extraordinarily mobile kidney with some evidence of formation of new fibrous tissue around it. The ureter was perfectly healthy. The kidney was next incised, but nothing was found except the mobility of the kidney to account for the bleeding.

Fixation of the kidney relieved the patient of hematuria, and the urine is quite clear.

All the cases of movable kidney in males that the author has operated upon have had hematuria.

The second patient, aged 64, gave a history of various attacks of hematuria during the past three years; in the last hemorrhage his urethra became blocked with a blood-clot and retention was caused. The bleeding lasted about two days, and left the patient very debilitated. He had lost about ten pounds in weight during the past year. Cystoscopy disclosed a papilloma on the left side of the bladder above the ureter.

The author discusses the cystoscopic appearances of simple growth. In cystoscopic examinations, if

a shadow is seen, then it is known that the growth has a pedicle, and it can be recognized as a simple growth, not malignant. A malignant growth is sessile, necrotic, and white. A simple growth has the color of normal mucous membrane, bears a multitude of finger-like processes, and casts a shadow.

Growths of the bladder, either simple or malignant, are causes of hematuria.

Another case is referred to by way of comparison with the first. It is that of a woman aged twenty. She was admitted on account of pain over the left kidney. When quite young, attacks occurred at fortnightly intervals, but for the past few years the attacks occurred at irregular intervals, commencing more often at night, and usually lasting forty-eight hours; they were invariably accompanied with severe retching and loss of appetite.

Examination showed the cardiac, vascular, respiratory and alimentary systems normal except that she was at the time under dental treatment. Incidentally the author advises that great attention be paid to the teeth when dealing with urinary diseases. The urine showed blood corpuscles and several epithelial cells. X-ray examination was negative and no macroscopic blood or pus appeared in the urine. Cystoscopy was done and the left ureter catheterized for a distance of 5 cm. The author made an exploratory incision and found a small, hydronephrotic, extremely movable kidney. The kidney and ureter were incised and a tube placed in the kidney wound, down to the bladder; no obstruction was found. There was a great deal of fibrous tissue formation around the kidney and the upper part of the ureter, and on division of the fibrous tissue bands the dilated pelvis almost at once resumed its normal appearance.

This case shows that one may find a very extensive lesion in the kidney following upon a movable kidney with no or only microscopical evidence of hematuria in the female, yet in the male there may be slight changes in the kidney and a good deal of hematuria. The reason is that in women movable kidney is a chronic condition, whereas in the male it is due to a sudden injury, in other words, movable kidney in the male is a dislocation.

The next case is introduced to show the value of cystoscopic examination.

A male patient was admitted to the hospital with a fracture of the pelvis in the region of the obturator foramen. The patient was in a state of collapse; blood appeared in the urine. An irrigating cystoscope was introduced and the bladder washed out through it; the bladder was found absolutely intact. To locate the hematuria, an endoscope was passed into the urethra and found in the region of the compressor urethra muscle a great deal of contusion in the mucous membrane of the urethra with blood oozing from the surface. There was sufficient evidence therefore that the injury was not in the bladder but was in the urethra. If an injury occurs to the posterior part of the urethra, blood may gravitate back into the bladder and hematuria may result.

In concluding the author gives a table of the likely causes of hematuria, excluding the medical causes, such as acute nephritis:

1. Growth of the bladder, either single or malignant.
2. Cystitis.
3. Enlarged prostate.
4. Injuries to the bladder and posterior part of the urethra.
5. Calculus anywhere in the urinary tract.
6. Growths of the kidney.
7. Tuberculous disease of the kidney.

Surgical causes of hemorrhage should be operated upon without delay to save the patient's life.

Palliative treatment may be used in cystitis if it will stop the cause of bleeding.

THEO DROZOWITZ.

Moes, M. J.: Non-Tuberculous Infections of the Kidney. *J. Louisiana St. M. Soc.*, 1918, viii, 41.

Recent studies show that the bacteria most commonly responsible for these infections are: the bacillus coli, the streptococcus, staphylococcus, bacillus typhosus, and paratyphoid bacillus.

The routes by which pathogenic bacteria invade the kidney are three: (1) the urinary tract, called an ascending infection, the common route of secondary infections; (2) the blood stream, usually referred to as hematogenous; this is usually a primary infection; and (3) contiguity, as by direct transmission from the colon to the kidney, or by way of the lymphatics.

Moes believes that in the ascending or urogenous types, the important factors are: (1) urinary stasis from whatever cause, in any part of the urinary tract; (2) abnormally patent ureteral orifices, such as permit a backing up or back-flow from the bladder; and (3) the presence of pathologic micro-organisms.

He urges that as soon as pus or blood is found in a urine, the source should be diligently searched for until definitely determined. It frequently will require cystoscopic examination, ureteral catheterization and X-ray to determine this. If pus is found in the urine, it must be definitely determined whether it has its origin within the urinary tract, and if it has, it should be traced through the bladder and ureter up to the kidney.

The author then discusses hydronephrosis and pyonephrosis and states that many factors have to be determined in studying these conditions: (1) the site and degree of obstruction; (2) the nature of the obstruction, whether due to impacted stone or compression from without; (3) the amount of function possessed by the affected kidney; and (4) the presence or absence of any lesion of the other kidney.

In speaking of nephrolithiasis Moes considers the following factors as entering into its etiology: (1) the finding of many of the urinary solids in saturated solution; (2) the influence of local irritation; (3) the presence of foreign bodies such as bacteria with infection, or of degenerated epithelium.

In treating infections of the kidney the author believes in alternately rendering the reaction of the urine acid, then alkaline. He administers urotropin when the urine is acid.

H. W. J. WALTERS.

Kretschmer, H. L.: Tuberculosis of the Kidney. Presentation of Three Cases. *Surg. Clin. Chicago*, 1918, I, 1139.

Renal tuberculosis, although usually primary in the genito-urinary tract, is secondary to some other focus in the body. Clinically the primary focus may not always be found, but a careful necropsy reveals a healed pulmonary or glandular focus, more often, however, the primary focus is clinically apparent.

Renal tuberculosis is found to be a disease of adult life, more frequently operative in women than men, due, no doubt, to earlier diagnosis in this sex; it is primarily unilateral, the right side being somewhat more commonly infected than the left.

Clinical, experimental and pathological evidence supports the hematogenous route of renal infection, which in turn becomes the primary cause of most instances of vesical tuberculosis.

The symptoms are conveniently divided into those referable to (a) kidney, (b) bladder, and (c) changes in the urine. Palpation of an enlarged kidney is often of value, as is also the demonstration of tenderness of this organ; however, these findings in the absence of signs or symptoms of more direct diagnostic importance are often misleading as the healthy kidney may be the palpable and tender one, due to compensatory changes. Colic is present at times, due either to passage of primary or secondary calculi or incrustations of necrotic tissue.

Frequency of urination is often the first symptom and nocturnal frequency is peculiarly characteristic. This condition later is associated with incontinence of urine. The frequency is associated with great urgency and pain either over the bladder or along the urethra. The bladder is especially intolerant to the most bland irrigating fluids under slight pressure and seems to be specifically intolerant to silver nitrate. In these hypersensitive bladders suprapubic tenderness may be readily elicited.

Ordinarily the cystoscopic picture is that of any other cystitis unless ulceration with tubercle formation in its periphery is present. Tubercle formation is confined usually to the region of the urethral orifice supplying the infectious material, however, important exceptions to this condition are sometimes found.

By far the most important finding is that of tubercle bacilli in the urethral catheterized specimen of urine, and this is the one finding that clinches the diagnosis. The organism may be demonstrated in about 90 per cent of the cases.

Pus in the urine is almost a constant finding but the amount is very variable from time to time, while hematuria, though not always present, especially early, is commonly produced by this infection.

and may be microscopic or so profuse as to obscure the other symptoms of renal tuberculosis.

Three cases are reported in detail, giving a complete clinical history, physical findings, cystoscopic findings, ureteral catheterization findings as regards ureteral obstruction and cultures, leucocyte counts, examination for tubercle bacilli of each urine, as well as complete phenolsulphonephthalein tests of the function of each kidney, the time of appearance of the dye and the total output in one hour being considered.

Blood and radiographic findings are given. The indications in each instance are clearly defined by summarizing the evidence.

One of these patients illustrates very well the occasional inadequacy of the phenolsulphonephthalein test for kidney function in renal surgical conditions especially. The right kidney secretes 2.3 per cent and the left but 1.6 per cent of phenolsulphonephthalein in one hour; the left kidney contains tubercle bacilli and the right contains none. Upon a second examination without instrumentation of any kind, the total output is 40 per cent in one hour. What appeared to be a very inefficient function is proven to be efficient. This finding occurs at times, due, no doubt, to instrumentation, especially ureteral catheterization, and is coincident with lack of urinary secretion. A second functional test, as was performed in this instance, usually suffices. On the other hand, polyuria is occasionally produced by instrumentation.

Kretschmer divides the ureter by means of a Paquelin cautery, the operative field being completely covered to prevent possible contamination. The pathologic condition of the ureter serves as a guide to where the ureter is to be severed. If it is thick-walled, with a small lumen, it is a safe procedure to resect as much as can easily be exposed; however, if the walls are thick with a dilated lumen, as complete a ureterectomy as possible should be performed.

In the usual case its section at the brim of the pelvis suffices. A few inches more or less ordinarily can not reasonably have much influence upon the future septic condition of the bladder or the formation of persistent sinuses.

The perirenal fat is often the seat of tuberculous infection in renal tuberculosis even when it looks and feels perfectly normal macroscopically. Tubercles are constantly demonstrated in such tissue, therefore Kretschmer isolates by multiple ligation as much of this fat as can conveniently be delivered and removes it, thus presumably reducing the tendency toward sinus formation to a considerable degree. Should the perirenal fat be indurated and thick, this part of the operative technique is dispensed with.

HARRY CULVER.

Furnias, H. D.: Renal and Ureteral Conditions in Women. *Am. J. Surg.*, 1917, XXX, 347.

The author enumerates the various pathologic conditions of the kidney and ureter to which women

are particularly disposed. Movable and floating kidney are in his opinion not to be operated upon unless causing Dietl's crises, gastro-intestinal disturbances or pyelitis. He warns against operating upon these cases in the presence of general enteroposes.

Stricture of the ureter likewise occurs with much greater frequency in women; also injury due to operative interference in the pelvis.

Furnias further discusses the choice of procedure in these cases.

J. S. EISENSTADT.

David, V. C.: Ascending Urinary Infections; an Experimental Study. *Surg., Gynec. & Obst.*, 1918, xxvi, 159.

David briefly reviews the literature dealing with the anatomical, clinical and experimental observations on the routes by which the kidney or its pelvis may become infected and concludes that the recent work leans strongly to the view of ascent of infection by way of the lymphatics of the ureter. Some of the reported work loses value because of lack of proper controls. The bacteriology of the normal urine of the animals should be known, as well as a thorough microscopic picture of the urinary tract at postmortem and the bacteriology of the blood. Among 30 dogs the control ureter showed no evidence of cellular infiltration in 14, while 10 had isolated round cell infiltrations in the submucosa and 5 others had this condition well marked. The last mentioned had normal bladder urines.

David used dogs exclusively in his experiments and colon bacillus as the experimental micro-organism. Urine cultures were made in all instances before experimentation and dogs having septic urines were excluded. All dogs had a section of the right ureter removed for microscopic study as a control and right hydronephrosis was established by ligation of the right ureteral stump.

David has attempted to determine in this experimental work carried out by careful aseptic surgical technique and equally careful bacteriological and pathological analyses:

1. The reaction of the bladder, under varying conditions of traumatism and obstruction, to the colon bacillus. He found that in unobstructed bladders into which colon bacilli had been injected that 9 bladders contained the organisms after intervals of three to thirty-two days and one was sterile after thirty-four days, while the left ureter and kidney pelvis contained bacillus coli only 3 times, and the right hydronephrosis was sterile in all but one instance.

There was no evidence of involvement of the muscularis and submucosa of these bladders by inflammatory exudate.

The bladders previously traumatized with turpentine showed edema and polymorphonuclear infiltration of the submucosa and in one instance the peri-ureteral lymphatics showed evidence of polymorphonuclear infiltration which decreased in amount as the ureter ascended and caused a

similar exudate in the kidney which contained the microorganisms. The majority of these bladders, however, contained non-infected urine in bladder and pelvis and yet showed peri-ureteral exudate, hence such infiltration is not synonymous with infection of the urinary stream.

In bladders partially obstructed by ligature, there was evidence of urinary retention and in 3 dogs all channels of infection of the left pelvis are excluded except ascent through the lumen of the ureter.

5. The involvement of the upper urinary tract from these acutely infected bladders. It is concluded that acute high grade cystitis is not commonly accompanied by extension of the infection to the upper urinary tract.

6. The probable routes by which this extension takes place. It is possible in an unobstructed bladder to infect the upper urinary tract by direct extension or the infection from the bladder through the lumen of the ureter. Cystitis in partially obstructed bladders is very frequently accompanied by the presence of the infection organism in the ureter and pelvis of the kidney, and this extension may take place by the lumen of the ureter or by direct involvement of the ureter by inflammation, by contiguity, or possibly by way of peri-ureteral lymphatics and infection of the subpelvic tissue, although evidence shows that most of these ascending infections are through the lumen of the ureter. HARRY CUNY.

Wise, F.: *Acanthosis Nigricans Following Decapsulation of the Kidneys*. *J. Cutan. Dis.*, 1918, XXXVI, 23.

The infrequency of *acanthosis nigricans* and the exceptional circumstance attending its provocation in the present case led Wise to report it.

The condition occurred one year after the decapsulation of the kidneys. The patient's skin had assumed a yellowish-brown tinge, increasing slowly but progressively, until the entire skin, excepting that of the face and hands, shared in the process.

Wise assumes one of the following possibilities: that the operative procedure had resulted in changes in the circulation, affecting the functioning of the abdominal or adrenal sympathetic, or of the adrenal gland itself; or that adhesions had formed, interfering with the normal functioning of the various tissues which they may implicate; or that exudates or proliferated fibrous tissues were exerting pressure on intra-abdominal structures which had in some unknown manner played an important rôle.

LOUIS GROSS.

Rapplee, W. C.: *A Study of the Kidney Function in Senility*. *Boston M. & S. J.*, 1918, LXXVII, 191.

This study was an inquiry into the functional condition of the kidneys in late life, designed in part as an assistance in the interpretation of post-mortem findings. A group of 41 patients was studied, in which group the ages ranged from seventy to eighty-eight years. None of the patients

had shown any fever, dyspnea, edema or other signs within a period which could in any way be considered as influencing the findings in this study. The hemoglobin of all the patients ranged between 75 and 100 per cent. The blood cytology was essentially normal. A great majority of the patients studied were active, not only working about the wards, but most of them had been engaged in manual labor or in the industrial rooms.

The patients studied were free from gross evidences of renal insufficiency or other compromising conditions such as fever, edema, dyspnea, marked anemia, etc., and most of them were active workers. Under the conditions of diet and hospital routine, the upper normal value of blood urea nitrogen was considered as 15 to 16 mg. per 100 ccm., the blood being drawn before breakfast, twelve to fourteen hours after the preceding meal.

Fifty per cent of the cases studied showed a moderate degree of retention, using the blood urea nitrogen figures as a criterion.

Fifty per cent of the cases showed a systolic blood pressure of 160 mm. or over; a higher percentage showed a diastolic pressure of 85 to 90 mm. or over. The blood-pressure readings were not considered to be related to either the blood urea nitrogen or to the rate of elimination of phenolsulphonphthalein.

In 27 cases in which the elimination of phenolsulphonphthalein was determined, 13 showed a value of 40 per cent or lower; 9 of these were 35 per cent or lower. A low value of elimination of the dye was associated for the most part with an elevated blood urea nitrogen. A good excretion was related for the most part with a relatively low blood urea nitrogen.

Twenty-five per cent of the cases showed albumin in the urine. There were no cases of glycosuria or hematuria. Practically all of the cases showed casts, which is a customary observation.

Sixty-six per cent of the cases showed either an elevated blood urea nitrogen or a depressed value of phenolsulphonphthalein elimination, i.e., 40 per cent or lower. If the findings of only a few casts in the urine be disregarded, and the blood-pressure also be disregarded, in the group of patients studied, about 70 or 75 per cent showed easily demonstrable evidences of kidney insufficiency.

The author notes that in this group there were several cases showing a relatively low blood urea nitrogen and a good renal function, but which had a considerable elevation of blood-pressure, the so-called cases of "essential" hypertension.

GEORGE F. HENLEY.

Christian, H. A.: *Tests for the Measurement of Renal Efficiency in Relation to Prognosis in Nephritis*. *Penn. M. J.*, 1918, XXI, 233.

In the patient with probable nephritis there are three important questions, i.e., diagnosis, prognosis, and treatment. The author deals only with prognosis.

A correct idea of prognosis is often made from general examination, but numerous errors have been made. Recent work in methods of quantitating renal function furnish data on which to base judgment as to prognosis, and have given better insight into nephritis. The importance of considering the patient as a whole cannot be emphasized too strongly.

Such extrarenal factors as severe anemia or cardiac decompensation influence renal function profoundly. Under such conditions renal function tests may indicate advanced nephritis and yet the kidney itself is structurally sound. Prognosis here depends on the type and severity of anemia or the character of the cardiac lesion, and renal function may be an unimportant factor. If renal function is depressed, one must determine by thorough examination whether it comes from a pathological kidney or from extrarenal disturbance before drawing conclusions. If the extrarenal disturbances get better or worse, renal function probably will change but prognosis depends more on the character of the extrarenal disturbance than on the renal function. Improvement of renal function accompanying improvement of extrarenal conditions is an indication of a structurally sound kidney.

If renal function is poor in the absence of serious disturbance in other organs, the probability of improvement in renal function is slight except in acute nephritis. In chronic nephritis prognosis can be determined from renal function with greater success than in extensive extrarenal disturbances.

Low renal function does not justify a diagnosis of nephritis. Extrarenal factors must be excluded or given their proportionate value. Used in this way, the tests help greatly in the diagnosis of nephritis.

When nephritis is present, the tests measure renal activity, and when there are no extrarenal factors, prognosis in chronic nephritis based on tests for renal function shows relatively few mistakes where renal function is quite low.

When renal function is fairly good, the chance of prognostic errors is greater. Repetition of tests at intervals gives some idea of the progress of the renal lesion and is of importance in prognosis.

There are two quite distinct groups of nephritics; in one the lesion progresses at a steady rate, rapidly or slowly; in the other progression seems to be by sudden exacerbations. This last group, even with repeated tests, cannot warrant predictions with safety and a more guarded prognosis must be given than in the former type.

In hospital practice the author makes use of four tests: (1) phenolsulphonephthalein elimination; (2) determination of the blood urea and the rate of urea excretion; (3) determination of specific gravity, sodium chloride and nitrogen content of the urine collected in two-hour portions during the day with special diet. At night one ten-hour specimen is collected and analyzed. Comparison of the day twelve-hour amount with the night twelve-hour amount is of value. (4) The amount of diuresis

produced by such a diuretic as theophylline. The phthalein test is made soon after admission if the patient is not incontinent or in coma. If incontinent or in coma, blood urea is determined. When blood urea is not increased considerably, the kidney can be excluded as a cause of coma or other serious symptoms and prognosis depends on existing extrarenal disturbances. If it is increased markedly, prognosis is grave. When the phthalein test can be satisfactorily made, it serves to group the nephritics preliminarily into mild, medium, and severe. In mild cases phthalein elimination is normal or slightly depressed. In them blood urea is normal or almost normal unless the patient is on a high protein diet. The Ambard coefficient in such cases is often normal.

In these mild cases the two-hour test is particularly useful. The patient is put on a standardized diet for two days and on the third day the special meals and the urinary collections of the two-hour test are made. During the day blood and urine are taken for the Ambard coefficient or the McLean index.

If phthalein excretion is 35 to 45 per cent, moderate renal disturbance is present due to intrarenal or extrarenal lesions. In such cases the two-hour test is of little value. The determination of Ambard's coefficient or McLean's index is more helpful.

In mild cases with cardiac disturbances and edema, if promptly improved by digitalis, renal function is good and prognosis should be based on the cardiac condition. If edema is marked, in combination with digitalis, a diuretic such as theophylline produces prompt diuresis and renal function is good; if not, renal function is poor and prognosis proportionately worse.

If phthalein elimination is below 35 per cent, renal function is poor and in patients without cardiac decompensation this indicates usually severe renal lesions. The drop in phthalein excretion down to zero indicates an ever increasingly bad prognosis. Ambard's coefficient usually parallels phthalein excretion. After phthalein excretion becomes low, determinations of blood urea are of value for as they continue to rise they indicate a nearer approach to uremia.

Many patients with chronic nephritis have arterial hypertension or arteriosclerosis, or both. They are liable to cerebral hemorrhage or to angina pectoris.

Such development cannot be predicted from tests of renal function. Likewise death due to cardiac decompensation cannot be predicted from renal function alone, but prognosis should depend on a proper evaluation of renal and cardiac condition.

Renal tests give valuable information as to renal function that helps in treating these cases, and from a consideration of both renal and circulatory conditions, helps in forming a far better idea of prognosis than if there were no measure of renal efficiency.

H. G. HANER

Alcock, N. G.: Renal Functional Tests and Pyelography in Kidney Diagnosis. *J. Iowa St. M. Soc.*, 1918, VIII, 45.

The secretion of water and the phenolsulphone-phthalein tests are the only two tests Alcock employs in making functional tests on kidneys. He employs both tests in combination with cystoscopy and ureteral catheterization. In the water test, he forces fluids into the patient and then later notes whether or not either or both kidneys respond to the increased fluid intake and which kidney responds the sooner and to the greater extent.

With the phthalein test, he injects intravenously 1 ccm. of a solution containing 6 mg. of the phthalein; note is made of the time of appearance on either side and the separate specimens are then collected for two fifteen-minute periods. Readings are made with a Dunning colorimeter.

Alcock calls attention to the fact that in order to get the most accurate information from the phthalein test, catheters should be left in the ureters long enough to allow the kidneys to adjust themselves. They should be left long enough to note that there is no change in the rate of secretion, that is, until the period of variance has passed. Further, he rightly points out that in very nervous patients, especially women, it is not infrequently noted that after ureteral catheterization hypersecretion of the kidneys will be observed, secreting from two kidneys as much as 24 ounces in an hour. The third factor is the leakage of urine around the catheters. Naturally this leakage will militate against correct phthalein readings.

For pyelography Alcock uses thorium solution, 5 to 10 ccm. of the solution injected into the kidney by means of a syringe. He considers thorium harmless. In doing pyelography he recommends that the catheter be passed by the ureter but not completely to the renal pelvis. The reason is that if the catheter is passed to the pelvis of the kidney, the course of the ureter is more or less determined by the catheter itself. If the ureter makes some unusual bend, the catheter will straighten it out; whereas if the catheter is passed just a short distance up the ureter and then the thorium solution is injected, one gets a shadow of the ureter as it lies in its normal position; also in cases of double pelves such pictures give more detail. H. W. E. WALTHER.

BLADDER, URETHRA, AND PENIS

Hunner, G. L.: A Rare Type of Bladder Ulcer; Further Notes, with a Report of 18 Cases. *J. Am. M. Assn.*, 1918, LV, 203.

The lesion under discussion is a chronic inflammation of all coats of the bladder wall; by the time these cases are treated the lesion is widespread.

In spite of this widespread lesion, there is remarkably little to be found by cystoscopy, and this is one reason that many of these patients have suffered fifteen years or more and have traveled from clinic to clinic in an effort to find relief.

The crucial test in cystoscopy is the finding of a small abrasion on the mucosa surface which, if not bleeding on discovery, will easily bleed on being touched with an instrument or with a cotton pledget. It is this minute area that gives rise to the urinary findings of a few leucocytes or a few erythrocytes or both when the urine is carefully settled or centrifuged.

Occasionally the distention of the bladder by air as the patient assumes the knee-breast posture causes this area to split and a tiny stream of blood flows to the vertex. In such a case one first notices the blood-tinged urine in the vertex in striking contrast to the perfectly clear urine that has just been drawn by catheter, and by sweeping the speculum around the equator of the bladder, one finds the blood streak and can trace it to the source.

The ulcer is usually found in the vertex or free portion of the bladder, as contrasted with the location of the Fenwick ulcer on the base or fixed portion. Its frequent location on the anterior superior wall is another reason for its having escaped diagnosis, this being a difficult area to examine with either the direct or the indirect methods of cystoscopy. The actual abrasions of the mucosa may be single or multiple.

These ulcers are always small, varying in diameter from 2 to 5 mm., and they appear to be very superficial. The author has never seen them covered with fibrin or with a deposit of urinary salts, nor has he seen them present a picture suggesting malignancy.

The cause of this type of bladder inflammation remains a mystery.

The chief symptom associated with this type of bladder ulcer is pain. Associated with the pain, the other symptoms of cystitis occur in varying degree, namely, frequency day and night, strangury, burning and smarting. The pain is often of the most extreme grade, the patient complaining of a jabbing or stabbing knife-like pain or of a sensation of a jagged, sharp stick in the bladder.

The histologic study of specimens removed at operation shows a fairly uniform picture in all cases. It is a picture of chronic inflammation involving all coats of the bladder and extending over the wide area which at operation shows the edematous thickening. At the site of the minute ulcer there is loss of the epithelial coat and the underlying mucosa shows the granulation tissue characteristic of an active ulcer. Other sections, taken from what appears to be an ulcer in the gross specimen, show an abrupt ending of the epithelial layer at the edge of an area that is evidently undergoing healing, and here the mucosa layer is less richly supplied with capillaries and is much like the mucosa beneath the epithelial covering, showing a preponderance of connective tissue and infiltration of small round cells and leucocytes.

The mucosa layer in the neighborhood of the ulcer shows an increase in the number and size of the capillaries, varying in the different specimens.

The capillaries are often stuffed with leucocytes, as are many of the lymph spaces.

After an experience with 15 cases, covering a period of seventeen years since treating the first patient, and a period of nine years since seeing the second patient and beginning to make a special study of this type of bladder inflammation, the author believes it safe to say that no form of treatment will suffice in these cases except complete excision of the inflammatory area.

The excision is done through a suprapubic incision. To facilitate the finding and handling of the bladder, it is left full of air if cystoscopy has just been done in the knee-breast posture, or it is distended with sterile fluid just before operation.

If possible, the operation is kept extraperitoneal. This can be accomplished in those cases in which the disease is confined to the vertex and anterior wall. If the disease involves a portion of the bladder covered by peritoneum, it is possible in some cases to separate the involved peritoneum, but more often the attempt at separation results in an opening into the peritoneum or into the bladder.

After excision of the diseased area, the bladder is closed by bringing the edges together with a running lock-stitch suture of twenty-day formaldehyde catgut No. 2, leaving a slight opening in the vertex through which the mushroom retention catheter is carried and sutured to the bladder wall with a No. 2 ten-day catgut. The abdominal wall is closed except for a small opening to carry the rubber catheter and two cigarette drains which are introduced down to the bladder wall.

These cigarette drains are removed at the end of forty-eight hours and daily irrigations of the bladder with a 1:10,000 solution of silver nitrate are carried on through the retention catheter, the strength of the solution being increased as the patient recovers. An ounce or two of the solution is introduced and immediately withdrawn through the catheter until several washings are made. This is best accomplished with the patient on his side.

The retention catheter is withdrawn on the tenth to the fourteenth day, after which the irrigations are given through the urethra daily until the bladder is free from infection.

EDWARD L. CORNELL.

Gibb, W. T., and Glassberg, J. A.: A Case of Patent Urachus, with Abscess Complicating an Hypertrophied Prostate. *Hosp. Bull. Dept. Public Charities, N. Y., 1917, 4, 36.*

The authors report a case of patent urachus which is especially interesting on account of the patient's age, the duration of the disability, the complete restoration of bladder function, and the closure of the urachal sinus.

The patient, a man of 74, was admitted to the hospital suffering from general abdominal pain and discomfort, complete cessation of urethral urination, and passing all his urine through the umbilicus. These symptoms had set in about three years ago and had gradually increased in intensity, until about

a month before the admission of the patient, of late his urethral flow had entirely ceased so that all of his urine passed through the umbilicus. The patient's abdomen was distended, his umbilicus protruded and from it flowed constantly a cloudy fluid with a urinous odor.

A rounded mass, dull on percussion and tender to pressure, was found in the hypogastric region just above the symphysis. On account of the considerably enlarged prostate a small sound could be passed only with difficulty into the bladder. The catheterized urine contained large amounts of pus and a few hyaline casts, and the fluid from the umbilicus showed an even larger admixture of pus than the bladder urine. Methylene blue appeared in the urine twenty minutes after the tablet had been swallowed.

After careful preparatory treatment under which the local and general symptoms had materially improved, suprapubic prostatectomy was performed under general anesthesia. On dividing the fascia, the rectus and pyramidales muscles a considerable amount of indurated tissue and adhesions were encountered over the bladder, and on going a little deeper, an abscess cavity was entered near the apex of the incision. This was evidently the distended urachus and contained about 60 ccm. of pus having a urinous odor.

This abscess was evacuated and carefully wiped out, and an irregular diverticulum of the peritoneum, which was entered in the lower angle of the wound, was closed by suture. The bladder wall was very thick and adherent to the surrounding structures, and it was impossible to push the peritoneum upward from its anterior surface. Through an incision into the bladder, about 4 cm. long, the enlarged prostate was easily enucleated, and on the twelfth day after the operation the suprapubic tube was removed. The suprapubic wound closed promptly without suppuration. There was no leakage of urine through the umbilicus after the operation, and the patient has been passing his urine normally and at normal intervals since the operation.

The case reported above represents the type of pathological urachus which is of the greatest interest to the genito-urinary surgeon, and which in most instances produces symptoms necessitating operative interference for relief on account of obstruction to the normal bladder outflow, due to either prostatic hypertrophy, impervious urethral stricture, impacted calculus, or obstructing new-growth. By these means such an amount of bladder distention may be produced that the urine, following the line of least resistance, seeks another outlet, enters the patent urachus and produces untoward symptoms calling attention to the condition.

Complete urachal fistula due to hypertrophy of the prostate in the aged is one of the most infrequent types of urachal abnormality, and from this viewpoint alone the report of the authors' case appears to be justifiable.

M. KROTOSZYNER.

Huhner, M.: *The Diagnosis and Treatment of Pathological Conditions in the Anterior Urethra Through the Urethroscope. Med. Rec., 1915, xlii, 1947.*

The author discusses the subject under the following divisions:

1. Description of the instrument.
2. Precautions and contra-indications in the performance of urethroscopy.
3. Preparation of the instruments and of the patient.
4. Appearance of the normal urethra through the urethroscope.
5. Pathological conditions in the anterior urethra seen through the urethroscope.
6. Treatment of pathological conditions through the urethroscope.

He describes in detail the kind of instruments to be used for diagnosis and treatment of urethral lesions, the precautions and contra-indications in the performance of urethroscopy, the preparation of instruments and of patients, solutions for medicating the urethra, the appearance of the normal urethra through the urethroscope, the method of performing anterior urethroscopy, pathological conditions of the anterior urethra as seen through the urethroscope, such as new-growths, cysts in the anterior urethra, polypi, urethral warts, carcinoma of the urethra, and cancer of the urethra.

The other conditions which may be recognized by the urethroscope are granulations and erosions of the urethral mucous membrane, infections and inflammations of the follicles and glands, and infiltration of the submucous tissue causing the different grades of stricture formation. In regard to the latter, he states that these infiltrations are of exceeding importance, as the forerunner of possible stricture. One must not wait until signs of obstruction appear before diagnosing a stricture of the urethra, but must make the diagnosis by the urethroscopic picture, before any signs of obstruction appear, and before it can be appreciated with the sound.

He describes the technique of destroying follicles by chemical means with the urethroscopic knife, by electrolysis and with the high-frequency current.

C. R. O'CROWLEY

GENITAL ORGANS

Fansler, W. A.: *An Unusually Large Sarcoma of the Testicle. Am. J. Surg., 1918, xxxii, 10.*

A brief report is given of a patient fifty years old with a tumor of the right testicle. He had been kicked in the testicle by a horse ten years before.

Other than a marked swelling at the time of the trauma and intermittent pain and slight swelling occasionally thereafter there were no symptoms until one year previous to the present examination. When a progressive enlargement developed and continued with increased rapidity until the tumor formed a mass 16 by 17 cm.

The mass was removed as completely as possible, and showed microscopically a rapidly growing sarcoma. Edema of the leg subsided at once and the mechanical interference of the mass was entirely removed. In spite of graduated doses of X-ray and Coley's fluid, recurrence was rapid.

HARRY COLVER

Beal, N. H.: *Suprapubic Prostatectomy. Canad. M. Ass. J., 1918, viii, 108.*

Thirty three per cent of all normal males over fifty years of age show enlargement of the prostate, and 40 per cent of these present symptoms. The author makes a plea for the recognition and more universal study of these unfortunates. Relief to the greatest number can only come when surgeons in general take a more active interest in this important branch of their work.

Investigation of the following points is absolutely necessary for good operative results:

1. Kidney function, including the determination of the phenolsulphonephthalein output, the total twenty-four-hour urine specific gravity, the total urea and microscopic findings.
2. Cardiovascular condition, blood and pulse-pressure and estimation of myocardial efficiency by an experienced internist. This group furnished the chief factor in the author's unsuccessful cases. Decompensation is an absolute contra-indication.
3. Infection. Cystitis is best relieved by suprapubic drainage continuing over a period of many weeks. Epididymitis can often be prevented by irrigation with 5 per cent argyrol before each catheterization.

4. Character of the growth. Cancer is more common than was supposed and the results of treatment rather discouraging.

The author prefers the suprapubic method for removal of the prostate in two stages, or in cases with very septic bladders the three-stage operation described by Hadley Williams. He thinks that the removal of the gland is really a shelling out of the enlarged lobes, the posterior portion carrying the ejaculatory ducts being left behind in most properly done operations. This allows the retention of the sex function as effectively as by the perineal route. Hemorrhage can best be controlled by careful dissection and the Hagner bag. Anæmia consequent on the loss of much blood greatly lowers the patient's resistance to infection and favors complications.

Efficient and experienced nursing is of prime importance in the after-treatment. Good bladder drainage is the best preventive for postoperative complications, such as epididymitis, phlebitis, etc. The prompt recognition of such complications is essential.

H. W. FLASCHMAYER

Bieberbach, W. D.: *Gonorrhœa in Young Male Children, and Its Treatment. Boston M. & S. J., 1918, lxxviii, 259.*

Gonorrhœa in the male child is a rare disease, at least in boys under twelve years of age, in contrast

to gonorrheal urethro-vulvo-vaginitis observed in the opposite sex. As etiological factors stand out attempts at intercourse, often suggested by a much older female, and contagion due to foreign bodies or fabrics previously infected being introduced within the urethra. The correct recognition of male infantile gonorrhea depends upon careful attention to inflammatory conditions of the prepuce or penis, especially in the presence of a long foreskin where a phimosis exists.

When these conditions are complicated by a purulent discharge, it is wise to examine carefully with a view to identifying the nature of the discharge under the microscope. Should an organism be ascertained resembling the gonococcus, then cultivation on artificial media is indispensable toward proving the nature of the infection. By these means only the differential diagnosis between gonorrhea and simple irritative urethritis is feasible, which in the beginning as a rule, cannot be established clinically.

In this connection the author relates in detail two interesting observations concerning true gonorrheal infection in four boys, ranging in age between three and six years, in whom the infection was due to the direct and indirect methods of contagion.

In tracing the source of infection, the aid of social workers appears to be indispensable as evident from the history of the first observation, where the chain of evidence was finally conclusively linked by these means.

In the care and treatment of the infected boys, proper prophylactic measures, including instructions to mothers as regards disposal of dressings, prevention of ophthalmia, diet, etc., play an important rôle. The therapeutic measures consist in the internal administration of balsams, i.e., thyresol, etc., which in appropriate doses is borne well by the children, and in local irrigations of the urethral canal by weak silver solutions, protargol or nitrate of silver, 1:8,000 to 1:14,000.

Irrigation is performed by inserting a soft rubber catheter, size 10 French, into the anterior urethra and gently forcing this fluid through by means of a large hand syringe. Following this a clean catheter of the same size is introduced just behind the cut-off muscle, and the same solution is forced through the posterior urethra to the bladder. When the child complains of bladder fullness the catheter is removed and the child is allowed to stand and empty the bladder. By repeating this local treatment every other day with due delicacy, a complete cure of the condition, as evidenced by subsidence of the discharge and appearance of equally clear and sparkling urine portions, may be obtained in about four weeks.

The article proves the importance of the microscopical examination of discharges in children suffering from phimosis in order by these means to clinch the diagnosis at the first visit.

H. KROTHSYNER.

MISCELLANEOUS

Edgerton, N. B.: The Diagnosis of Urinary Lithiasis. *J. So. Cal. M. Ass.*, 1918, xiv, 38.

In the diagnosis of urinary lithiasis the author insists on the following points:

1. A well taken history and complete physical examination.
2. Good radiographs.
3. Complete study of urinary findings, kidney function, etc.

4. Complete cystoscopic examination, including passage of ureteral catheters and pyelography.

Pain due to stone is present in 70 per cent of cases and may be fixed, radiating, or referred. If the causative factor is in the kidney there is often a dull ache in the lumbar region. The pain of ureteral stone usually follows the surface markings of the course of the ureter, dependent somewhat on the location in the ureter, extending sometimes down into the testicle, leg, and foot of the same side.

Care is necessary in the differential diagnosis, as confusion with a high-lying appendicitis, disease of the gall-bladder, pancreas, perforating gastric ulcer, mesenteric embolism, tubo-ovarian disease and subdiaphragmatic abscess is easy. Stone in the intravesical portion of the ureter often gives rise to dysuria, frequency, meatal pain and occasionally the passage of a few drops of blood. Young has observed seminal and testicular phenomena and chronic rectal symptoms increased at the moment of defecation. Blood is present in the urine except when the stone is not movable and smooth and regular in shape. Infection takes place in about 65 per cent of cases with the presence of pus.

Radiography with the passage of catheters impermeable to the X-rays and injection of thorium will often clear up a questionable diagnosis. Passage of a ureteral stone will sometimes take place after ureteral catheterization due to the resultant strong muscular contractions.

H. W. PLASSMETER.

Schapiro, S. W., and Spiegelberg, S. L.: A Preliminary Report of the Study of the Genito-Urinary Tract in 600 Cases of Pulmonary Tuberculosis. *Heip Bull. Dept. Public Charities*, N. Y. 1917, i, 92.

The patients under consideration in this series numbered 600; there were 362 males and 238 females, all adults. The cases were not unlike those generally met with in everyday practice, thus explaining the more favorable findings and the considerably smaller percentage of complications in the genito-urinary organs than in those of other observers. The investigations, carried out according to a careful routine, yielded the following results:

Seventy-three of the total amount of patients, or 12 per cent, gave a history of subjective symptoms referable to the genito-urinary tract, i.e., nocturnal and diurnal frequency, tenesmus, etc. Urinalysis revealed in 135 cases albuminuria, 143 cases con-

tained pus cells, 133 showed casts, in 6 cases haematuria was noted, and in 12 cases a specific gravity of 1.010 or less was found. In the presence of acid-fast bacilli in the urine, only catheterized specimens were considered, in order to guard against contamination of the urine with smegma bacilli. In the 33 patients who presented subjective symptoms referable to the genito-urinary tract a cystoscopic examination was made, to which in the cases showing acid-fast bacilli in the catheterized bladder urine was added ureteral catheterization wherever possible.

In 37 of 73 cases presenting subjective urological symptoms, tubercular lesions of the bladder, the trigone, or the ureters were ascertained. In 36 cases, or in nearly 50 per cent, no such lesions could be found on closest scrutiny, thus demonstrating the apparent frequency of symptomatic reflex irritation. On the other hand, tubercular lesions were found in the bladder of 25 patients who had neither subjective symptoms referable to the urogenital tract, nor acid-fast bacilli in the urine.

It was also found that several patients with neither demonstrable lesions in the urogenital tract nor subjective symptoms had tubercle bacilli in the

urine, and that patients with local tubercular lesions in the bladder and with urinary symptoms showed no tubercle bacilli in the urine. The latter occurrence is explained by the authors on the basis of intermittent elimination of showers of tubercle bacilli, so that it is quite possible to get specimens of urine between the showers which are free of bacilli, while the former observation gives additional weight to the theory that the kidneys can and actually do excrete tubercle bacilli without themselves becoming infected.

Of 91 guinea-pig inoculations with urines presenting acid-fast bacilli, a positive result was obtained in 23 cases, or in 25 per cent, showing a comparatively very small percentage for the total number of cases studied, i.e., one in 27, as against one in 11 in Cunningham's, and one in 10 in Bernstein's statistics.

Of occasional lesions of tuberculosis among the male patients, 23 had tuberculosis of the prostate, 11 had tubercular vesiculitis and 16 had tubercular epididymitis, and among the 37 cystoscopes in tubercular bladders, 10 tubercular prostates, 4 tubercular epididymes and 3 tubercular vesicles were found.

M. KROTOSZYNER.

SURGERY OF THE EYE AND EAR

EYE

Roy, D.: Late Infection with Enucleation Following an Operation of Iridotomy for Chronic Glaucoma. *Arch. Ophthalm.*, 1918, XLVII, 42.

A case of infection of a glaucomatous eye requiring enucleation five years after the operation of iridotomy is reported, the author stating that it is the first on record.

The factors contributing to the accident were:

1. The eye showed some slow choroidal changes and was myopic, this evidently progressing and thinning the tunics of the eyeball, causing it to give way at the point of operative incision.

2. No retention suture was used in the conjunctival flap, which is regarded as the serious mistake in this case.

3. Too large an incision was made at the sclero-corneal margin, allowing too large a piece of iris to be pulled into it.

S. S. HOWE.

Mansilla, G.: Sarcoma of the Right Optic Nerve (*Sarcoma del nervio optico derecho*). *Siglo. med.*, Madrid, 1917, LXIV, 979.

A woman of sixty-three years showed exophthalmia, immovability of the right eye, and atrophic optic neuritis. These symptoms suggested a tumor of the orbital fundus. The Wassermann reaction was negative. Evisceration of the cavity was decided on and carried out under chloroform anesthesia.

On dissecting the lids, the fingers were inserted into the orbital cavity and discovered a rounded mass behind the eye-ball which occupied the orbital fundus and was adherent to the posterior pole. The nerve was sectioned and the eyeball separated and the new-growth and all orbital contents removed. The cavity was then curetted, cauterized and filled with a gauze tampon. The woman recovered completely and there is no sign of recurrence.

The tumor, which was situated in the posterior part of the eyeball and in contact with it and the optic nerve, was microscopically examined and pronounced a fibrosarcoma. Pulido mentions another case in a child two years old.

W. A. BRENNAN.

Burge, W. E.: The Production of Cataract. *Arch. Ophthalm.*, 1918, XLVII, 12.

A series of experiments were conducted to determine the essential cause of cataract, the investigator summarizing his work in the following conclusions:

1. Sodium and potassium salts act specifically on the nucleus of the lens, producing nuclear opacity, while calcium salts act on the cortex, producing cortical opacity.

2. The short wave lengths of the spectrum produce such a change in the cells of the lens that the calcium and sodium salts, which are found to be greatly increased in human cataractous lenses, can combine with the protoplasm and precipitate it, thus producing an opacity.

3. That ultraviolet radiation kills living cells by coagulating their protein may be seen by direct observation through the microscope during an intense exposure of unicellular organisms such as paramecia.

4. An opacity of the lens can be produced in fish living in solutions of those salts found to be increased in cataractous lenses, by exposing the eye of the fish to the radiation from a quartz mercury-vapor burner.

5. In looking for the cause of cataract, it would seem that at least two factors should be considered, the one a modification of the protein of the lens by ultraviolet radiation, the other certain inorganic salts by which the modified protein can be precipitated.

S. S. HOWE.

Kirk, J.: Eye Changes in Trench Nephritis. *Brit. M. J.*, 1918, I, 7.

In the spring of 1917 the author had the opportunity of examining 70 or 80 cases of war nephritis, most of them young, active soldiers twenty to thirty years of age. There was usually severe exposure and strain, and nearly all of the cases were severely acute and seriously ill. Invariably there was marked retinal congestion, with large pulsating veins and no patches of exudation or nerve involvement on admission.

Examination of these cases again about three months after the onset of the illness classified them into three groups, A, B, and C.

Group A included 21 patients, convalescent, with practically no symptoms except slight anemia and debility, usually with normal urine. In only 4 of these patients were retinal changes present and they were slight, i.e., a few small spots of exudation, slight haziness of the disc, or a little edema along the course of the veins.

Group B included 20 cases. Albumin was usually present; often dyspnea and some edema. Eight cases showed small exudation spots and one showed marked retinal changes.

Group C included 13 cases. The disease was still marked, with general symptoms, severe edema, much albumin and sometimes blood. Four cases had very definite retinal changes, and four had changes of slighter nature. In none were there signs of any other complicating disease.

In this series, while the spots of exudation were generally in the usual situation, in no case was

seen the typical starlike figure of the chronic cases. Hemorrhage was not common. The optic disc often showed a definite swelling, and small areas of edema were noticed along the course of the veins.

In summarizing, the author states that in this disease the retina is very liable to involvement, although gross changes are not evident in the early stages. The pathology is probably an acute congestion, resulting from some specific toxin; the exudation is partly lymphoid and partly cellular and probably clears up in the majority of cases without permanent results. The retinal changes do not affect the prognosis except that the severer the changes, the severer the case in most instances. The condition is probably allied to the acute retinitis of pregnancy, scarlatina, acute uremia, etc., and should not be confounded with the retinitis of chronic kidney inflammation.

V. C. HUNT.

Thompson, H. M.: The Effect of Intestinal Stasis on the Eye, Especially in Iritis. *J. Ophth. & Oto-Laryngol.*, 1917, XI, 343.

The author states that the fact appears to be proven beyond doubt that recurrent iritis has its origin in chronic intestinal stasis. He discusses the theories of intestinal auto-intoxication and intestinal subinfection, and reviews the work of Crile, Lane, and others.

He reports the case of a woman of thirty-two who had suffered for fourteen years from recurrent iritis, rheumatism, and a vertebral polyarthritis. She has remained well for three years and gained in every way since the removal of a chronically ulcerated appendix with concretions and the breaking up of adhesions around the cæcum.

The author believes that when a case has become progressively worse under medical treatment, surgical procedures directed to the intestinal tract are indicated, and that many chronic eye lesions cannot be cured in any other way.

S. S. HOWE.

EAR

Babcock, H. L.: Some Observations on the Bárány Tests as Applied to Aviators. *Boston M. & S. J.*, 1917, LXXVI, 549.

Besides detailing the methods of examining the vestibular apparatus as regards nystagmus, the pointing tests and falling, the author has made some observations on the effect of turning on the pulse rate. One hundred cases were thus studied.

The average pulse rate per minute before turning was 78; after turning, 87. The average pulse rate increase per minute was 9. The lowest pulse rate per minute before turning was 58; the highest, 108. The lowest pulse rate per minute after turning was 60; the highest, 111.

In 80 cases the pulse rate increased after turning; in 12 cases there was no change. In 8 cases the pulse was lower after turning. The greatest increase was from 80 to 116; the greatest decrease was from 76 to 60.

OTTO M. ROTT.

Steel, G. E.: Mastoiditis. *N. Y. M. J.*, 1918, CXL, 641.

Approaching his subject from the standpoint of the patient and the general practitioner, the author discusses (1) the necessity for operative interference, (2) the danger to life, (3) the danger to hearing, (4) the amount of deformity, (5) the time for healing to occur, (6) the required absence from business.

In deciding the necessity for operative interference, the following terminations should be kept in mind:

1. The case may go on to spontaneous recovery with little or no treatment, and function may be restored to normal, especially in children.

2. It may recover as far as mastoid symptoms are concerned, but the ear may continue to discharge steadily or intermittently, the perforation in the drum membrane may remain open, and the function be progressively impaired.

3. The patient may ultimately recover spontaneously after an unduly prolonged period of aural discharge, the perforation in the membrana tympani healing; but deposits, bands or adhesions may remain which impair function, give rise to a distressing tinnitus, which may finally result in marked deafness.

4. Complications may develop, with or without operation, which may result fatally or jeopardize life.

5. The patient may undergo mastoidectomy and recover with or without impairment of hearing.

Laboratory aids, such as blood count, bacteriological examination and X-rays, are mentioned as of service in reaching a decision.

The prognosis in a mastoidectomy, done where there are no cranial complications and in a patient otherwise healthy, is exceedingly good.

In a mastoidectomy done at the right time before destructive changes occur in the middle ear, the hearing will return to its former condition before the operation.

As to length of time for the healing of the mastoid wound, the average period is six weeks. In an uncomplicated mastoiditis, the patient should remain in the house for ten days after the operation and remain away from business for at least two weeks.

OTTO M. ROTT.

Wilson, J. G.: The Effect of High Explosives on the Ear. *N. Y. M. J.*, 1918, CXL, 357.

The cases of deafness due to war conditions could be divided into two classes, one including all cases in which there had been a direct wound of the ear by a missile and the other including those injured by the effects of an explosion without direct wound of the ear. It is the latter class alone which the author considers. These cases had been termed shell shock deafness and there has been a great tendency to associate the condition with hysteria and neurasthenia, but the author advises the avoidance of these terms as confusing.

The effect of a high explosive was a great and sudden compression followed by an equally great

and sudden decompression. This compression and decompression could amount to 10,000 kilograms a square meter. The author referred to the fact that there were certain normal limits to the capacity of the auditory apparatus to withstand pressure changes, and that pressures beyond the normal caused disturbances of hearing such as hyperacusis, hypo-acusia, or total deafness.

The men with symptoms of nerve deafness due to the effects of high explosives could be classified as those with true nerve deafness; those who had had nerve deafness and who retained the fixed idea that they could not hear; and those who were malingering. The first class alone is discussed, and in this class there are three groups of cases.

In the first group, the nerve deafness was associated with damage to the conducting mechanism, such as perforation of the tympanic membrane, hæmorrhage into the middle ear, or infection of the middle ear. The second group comprised those cases in which there was no demonstrable lesion in the conducting mechanism. The third group was composed of those cases in which there was destruction of the cochlea and semicircular canals or their nerves.

The deafness might be partial or total in either of the first two groups, but was always total in the third. The symptoms of all three groups fell within the description of traumatic neuroses and most of the patients exhibited variable and complex symptoms aside from deafness. Such symptoms included the various common manifestations usually associated with neurasthenia or hysteria.

The author pointed out that in those cases where there were no evidences of structural injury, there

still might be some microscopic damage to the structures of the internal ear. In this connection the author reported two specimens, secured within six hours after death, in which it was known that the patient had sustained the effects of high explosives and developed nerve deafness. The microscopical examination revealed lesions confined to the cochlear structures, closely resembling the experimental lesions made on animals by pistol shots. The membrana tentoria was found swung up against Reissner's membrane and was attached to it by a serous and cellular exudate. The organ of Corti showed marked swelling of the cells, and microscopic hæmorrhages were found in the internal ear alone with evidences of an acute neuritis of the eighth nerve. No hæmorrhages were found in Corti's organ. With these lesions it was found that the stapes was intact and the vestibule had not been injured.

Concerning the methods employed for improving the hearing, the best results were obtained by stimulating the nerves by means of the voice and tuning forks through resonators. Electricity was harmful. No results were obtained where the internal ear was destroyed.

As a preventive measure the author recommends the Wilson-Michelson hard rubber device which permitted the hearing of all normal sounds, but which also closed tightly in response to loud noises and protected the ear against injury by detonations. This device was smaller than the Malloch-Armstrong protector and did not irritate the canal or cause any discomfort to the wearer. Cotton plugs and wax, or cotton impregnated with petrolatum were condemned. OTTO M. RORT.

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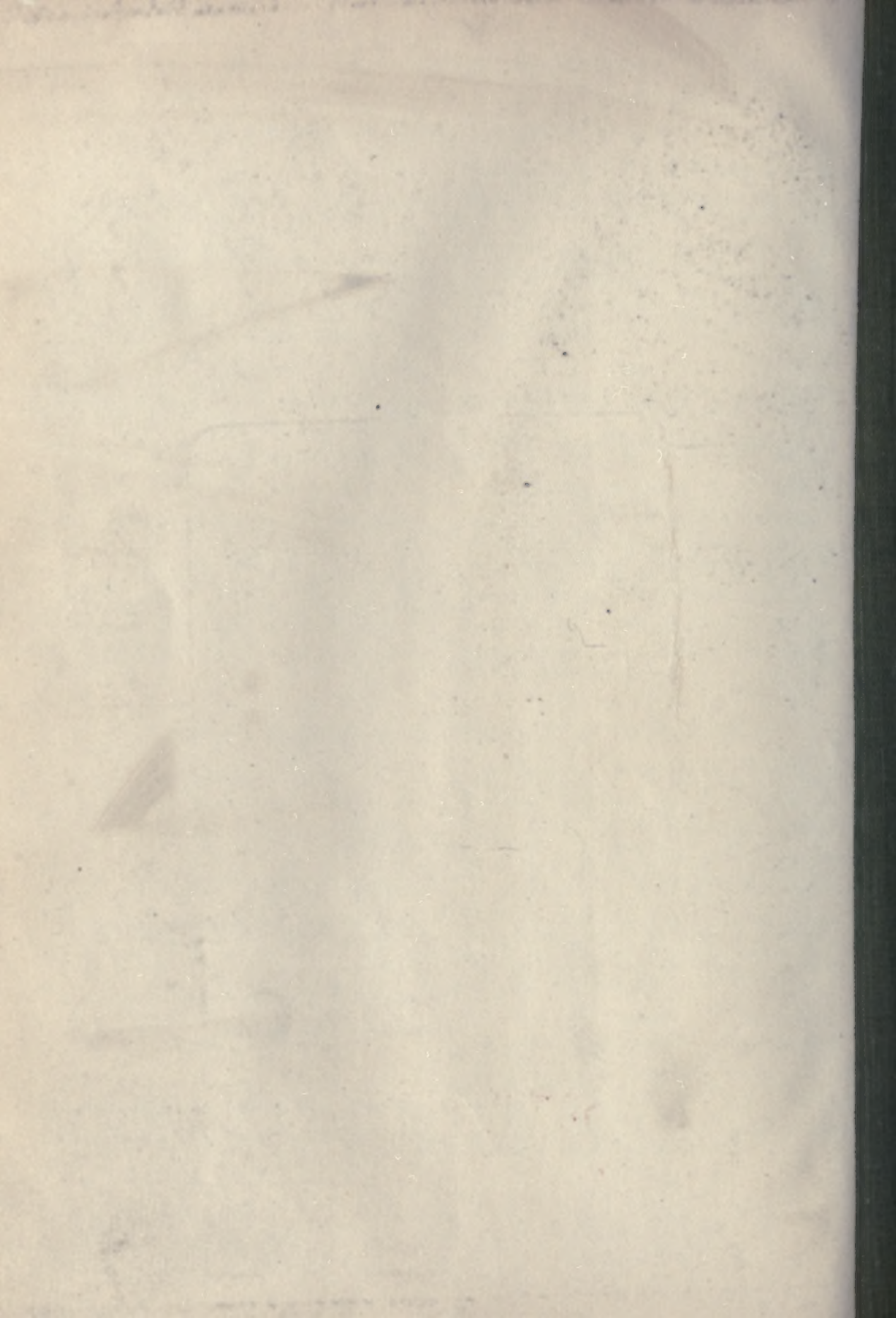
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